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**IN OCCUPATIONAL**  
**ATTAINMENT**

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**CENSUS 86 - BIRTHPLACE DIFFERENCES  
IN OCCUPATIONAL ATTAINMENT**

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Australian Bureau of Statistics**

AUSTRALIAN BUREAU OF STATISTICS

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  - *for information about other ABS statistics and services* please refer to the back page of this publication.
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## PREFACE

This occasional paper was written by Dr Graeme Vaughan, Australian Bureau of Statistics. It is based on a detailed analysis of 1986 Population Census data undertaken when Dr Vaughan was a Research Statistician at the ABS.

The ABS objectives for the Research Statistician Scheme are to encourage the greater use of ABS data in academic and other research, to encourage the development of new analytical techniques for the analysis of data and to increase the general level of research into problems relevant to the ABS.

The conclusions drawn and observations made by Dr Vaughan are his own, and do not necessarily represent the views of the Australian Bureau of Statistics.

Any detailed enquiries about his analysis should be directed to Dr Vaughan(06-252 7030). Any requests for data from the 1986 Census, the 1991 Census, or other ABS statistics should be directed to Ms Suzanne Droop, Information Services Branch (06 252 6295).

**RICHARD MADDEN**  
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I wish to record my gratitude to the Australian Bureau of Statistics for the Research Statistician Scheme Fellowship and for providing the necessary facilities to complete this research project. I gratefully acknowledge the assistance of Mr Tim Skinner and Mr Alan Mackay (Social and Labour Division of the Australian Bureau of Statistics) for advice on the general conduct and progress of my research; Mr Dietmar Ott for assistance in programming in SAS and the ABS operating system and for drawing the data from the Census files; Professor Frank Jones (Australian National University) and Mr Denis McDermott (Welfare and Social Analysis Section) for helpful discussions; and the staff of Statistical Services (Social) for statistical advice.

## SUMMARY

This study investigates factors affecting skill level occupational attainment of overseas born groups compared to the Australian born using 1986 Census data. Explanations for occupational attainment can be divided into those which allege that occupation is the outcome of achieved characteristics (education and labour market experience, for example) and those which hold that it is strongly influenced by ascribed characteristics such as ethnicity.

Hypotheses concerning labour market endowments and the transferability of human capital attributes (achieved characteristics) and discrimination, assimilation, divided labour markets and ethnic enclaves (ascribed characteristics) are applied to the question of birthplace differences in skill level occupational attainment. Differences between the overseas and the Australian born are significant only for Southern Europeans. For all groups except the Asian born, differences in occupational attainment result from the non-transferability of human capital attributes to the Australian context. For all non-English speaking country groups, including the Asian born, the ability to speak English well is a major factor affecting occupational attainment. For the Asian born only, cultural factors appear to remain a plausible explanation for differences in occupational attainment. This conclusion should be treated with some caution, however, as the data do not allow a direct test of the discrimination hypothesis.

## NOTE

This paper is part of a study exploring sex and birthplace differences in occupational attainment, which investigated factors affecting skill level occupational attainment of women compared to men and overseas born groups compared to the Australian born. The study concluded that occupational attainment differences between males and females may be explained in somewhat different terms than those used to account for occupational differences between the Australian and the overseas born. The differences between men and women in occupational attainment, considered in terms of the broad skill levels of the ASCO classification, is the result of male-female differences in education and labour market experience. The differences between the Australian born and the overseas born groups is not simply the product of inter-group differences in labour market endowments. Indeed, inter-group differences in labour market endowments somewhat hide the differences in occupational attainment between the overseas and Australian born. With the exception of the Asian born, differences between the overseas and Australian born are mainly the product of the non-transferability of education and labour market experience from the overseas to the Australian context. Consequently, adult, rather than child, immigrants are disadvantaged in the Australian labour market. In the case of the Asian born, it appears that their occupational attainment is strongly affected by the phenomenon of cultural discrimination, with English speaking immigrants able to partly overcome this disadvantage. For all immigrant groups, the ability to speak English well is a major factor affecting their occupational attainment.

Because it was found that differences in occupational attainment for women and migrants, compared to men and the Australian born, arise from different causes, the study is published in two parts, *Sex Differences in Occupational Attainment* (6283.0) and *Birthplace Differences in Occupational Attainment* (6282.0). However, it should be noted that both papers start from the same perspective, focusing on the question of what factors affect the relative occupational distributions of different groups in the Australian community. Both papers also use similar theoretical tools and analysis for the investigations.

## 1. INTRODUCTION

This paper focuses on the question of what factors affect the relative occupational distribution of different birthplace groups relative to that of the Australian born. Two broad categories of explanation for such differences may be distinguished: the first based on acquired or achieved characteristics relevant to job performance and the second on ascribed characteristics not directly related to job performance.

In the first category of explanations are located the two traditions which dominate much current research in sociology and economics - status attainment and human capital theory respectively. In sociology, status attainment research focuses on the link between socio-economic background and achieved characteristics, such as education, and occupational attainment (See, for example, Broom and Jones 1976). Similarly, the human capital theorists argue that people act as rational individuals who attempt to maximize their lifetime incomes, by making optimal decisions regarding time spent in education and training, and choice of occupation (Becker, 1975; Granovetter, 1981) If it is assumed that approximately free market conditions prevail in the labour market, then occupational attainment will be meritocratic, based on the possession of skills and knowledge relevant to job performance, in particular education, training, job skills and experience. The implication of these theories is not that there will be no differences in occupational distribution between groups defined by birthplace, but that such differences as do occur will reflect only group differences in factors relevant for job performance (See, for example, Evans and Kelley 1986).

In contrast, explanations based on the notion of ascription propose that factors extraneous to job performance constrain occupational attainment in a systematic and consistent manner. Consequently, certain groups in the community, such as immigrants from particular countries, are forced into occupations where incomes are lower, work conditions poorer and often unregulated, promotion opportunities few and unemployment a recurrent feature. Indeed, it has been argued that women, migrants and blacks form the core of a secondary labour market in Australia, as elsewhere (See, for example, Manderson and Inglis 1984, Gilmour and Lansbury 1978, Vaughan 1992). The explanations as to how this segmentation developed and is maintained are generally couched in terms of social discrimination, more general theories of social stratification, or the relatively independent effect of ethnic cultural factors.

Social prejudice against migrants may lead to systematic discrimination against them either by employers, who resist hiring migrants, or employees, who resist working with them, or both. There is substantial evidence that the belief systems justifying discriminatory practices are evident in Australia. Summing up a wide range of data on the subject Western (1983: 297) suggests that "the ethnic stereotypes which were in existence thirty or so years ago are still well and healthy today". Such discrimination, reinforced by belief systems justifying such action,

channel migrants into the secondary labour market where income is low, work conditions are poor and jobs insecure (Bonacich 1979; Doeringer and Piore 1971; de Lepervanche 1975; O'Malley 1978; Wild 1974). This discrimination and its supporting belief systems are seen as important, but subsumable, mechanisms by the remaining two forms of explanation.

Other explanations see occupational inequality in terms of more general theories such as Marxist class theory. In Marxist class terms, Collins (1975, 1978, 1984a, 1984b), for example, argues that groups, such as immigrants, function as an industrial reserve army to keep wages and labour costs down and as a buffer against unemployment for Australian born people, thus segmenting the working class and preventing the development of class consciousness. Such events as the mass migration program after 1947 resulted in a segmented workforce where Anglophone and northern European immigrants occupied labour market positions similar to those of the Australian born while non-Anglophones were concentrated in the semi-skilled and unskilled jobs, often outside the system of regulated wages and conditions. Thus the segmentation of the labour market is seen to result from the working out of the interests of the capitalist class, concerned to reduce labour costs and to prevent structurally threatening political action by the working class, and the interests of the 'labour aristocracy' who consequently enjoy higher wages, better working conditions and job security relative to those confined to the secondary labour market.

On the other hand, Lever-Tracy (1981) argues for the ethnic segmentation of the working class but against the notion of a dual labour market. According to her analysis, the labour market is segmented into six key categories, divided by both ethnicity and gender: Australian and Northern European born men, Southern European born men, Aboriginal Australian men and the corresponding groups of women. She argues that the jobs undertaken by migrants in particular are primary, not secondary, to the interests of capital, and hence that the notion of a dual labour market does not fit the Australian experience (see also Bottomley 1988).

Ethnic cultural factors may also influence the occupational distribution of birthplace groups. From the assimilationist perspective, cultural differences modify the operation of other factors affecting occupational attainment. Birthplace groups differ in the extent to which their cultural norms approximate that of the dominant Anglo-celtic culture. Hence it is argued that, regardless of the general processes affecting occupational attainment, those groups with greater cultural affinity to the dominant host culture will have an occupational profile most like that of the Australian born. Similarly, individuals within all groups who have attributes of the dominant culture are more likely to attain occupations at the same level of skill as the Australian born.

Alternatively, groups which have been in Australia for some time and possess strong cultural cohesion and ethnic

group identity may form ethnic enclaves within the broader economy. Entrepreneurs may establish businesses serving the needs of ethnic communities or of the wider society which employ workers predominantly or exclusively from a particular ethnic group. Such enclave enterprises serve to shield ethnic workers from disadvantages experienced as a result of the open operation of market forces, discrimination or cultural distance. Hence, the occupational profile of groups with enclave enterprises may be less affected by these processes than the profile of groups without such protection (Evans 1987).

In characterizing the different approaches to explaining occupational inequality, I have largely, and quite deliberately, glossed over the very real differences in the range of theoretical positions covered. For the purpose of this analysis, the main distinction is the very broad one between explanations which see occupational inequality as the outcome of achieved characteristics and those which are based on ascriptive factors. Explanations based on the assumption of a competitive labour market imply that group differences in occupational attainment will be insignificant once the factors relevant to job performance are considered. On the other hand, the various explanations which assume that occupational attainment is, at least in part, a product of ascription, lead to different empirical implications: that group differences will remain important even when these factors are taken into account, and/or that additional factors relevant to the nature of the group will need to be considered.

In the case of discrimination, which cannot be measured directly, its presence may be inferred by the residual effect of the characterising variable (in this case, birthplace) after factors likely to affect occupational attainment have been considered. A note of caution is warranted because it is not possible to identify or measure all factors which may reasonably be expected to influence occupational attainment. Indeed, a number of possible factors which could not be measured in this study are identified below. Discrimination may also be inferred from the way in which extraneous factors affect occupational attainment; if discrimination against a group is systematic then relevant labour market characteristics may be less important than extraneous factors.

In the case of explanations which subsume ethnic occupational inequalities in broader social processes, the empirical implications are less clear cut. Nevertheless, they imply that ethnic inequalities in occupation are likely to be accounted for by factors relating to class, status and power positions. While factors relevant to class and status (for example, standard of living, parental occupation and education) are obtainable, they were not available for this analysis due to the nature of the data source. An exception to this is the education variable, which is also a factor relevant to job performance. Hence the interpretation of results in terms of these types of explanations is likely to be difficult.

The implications of explanations based on ethnicity itself as being of major importance are not as clear cut as they

might first appear. While a result which demonstrated that no factors other than birthplace were important would provide powerful evidence for these explanations, its absence does not necessarily refute them. Rather it could suggest that the effect of ethnicity on occupational attainment was mediated by other social inequalities. Such an impression would be strengthened if these other factors were not job related, but rather characteristic of the group.

Hence certain empirical questions arise from this consideration of the types of explanations which have been put forward to account for inequalities in occupation. To what extent are differences in the occupational distribution of ethnic based groups the result of:

- (a) the independent effect of birthplace on the occupational distribution;
- (b) differences between the groups in factors relevant to occupational attainment (e.g. education and labour market experience);
- (c) differences between the groups in other factors (e.g. English language skills, period of residence in Australia);
- (d) residual, unmeasured factors?

## 2. Advantages and limitations

The nature of this analysis offers certain unique advantages compared to previous studies, but also carries with it its own set of limitations. First of all, this study brings unique data to bear on the question of occupational attainment. Whereas previous research used the one percent Census sample or sample surveys such as the ANU 1973 mobility study (for example, Evans and Kelley 1986; Kelley and Macallister 1984), the data used here has been extracted from the entire unit record data file of the 1986 Census of Population and Housing conducted by the Australian Bureau of Statistics. This data source is not publicly available for multivariate analysis and is more extensive than publicly available data such as the one percent public use Census sample and frequency and cross-tabulated tables generated from the 1986 Census and Labour Household Surveys. However, the size of the data file has created some practical and statistical difficulties, which are discussed below.

Second, the data are more recent than previous studies which were conducted using data collected from 1970 to 1981, which can tell us nothing about the experiences of recent migrants in the occupational structure. This issue remains of current concern. Since 1981, immigration has again become the focus of public debate, particularly over the question of Asian immigration. While it would be unwise to allege that community attitudes have shifted dramatically in the direction of greater intolerance, it is plausible that discriminatory attitudes towards immigrants may have gained more social acceptance since 1981. If nothing else that debate has made the retesting of the hypothesis of discrimination worthwhile.

Third, this analysis improves on previous work by using a better measurement of the dependent variable, occupation. The new Australian Bureau of Statistics'

classification of occupations, the Australian Standard Classification of Occupations (ASCO) offers a number of improvements over previous classifications, such as the Census and Classified List of Occupations (CCLO) and derived scales such as the ANU2 scale of occupational status. Unlike CCLO, ASCO is based on a clear set of criteria derived from the principle that occupations are defined by the type of work, the set of primary tasks common to particular jobs. These criteria are designed to measure the skill required to perform primary occupation tasks. ASCO represents a considerable improvement over CCLO, in that it is based on more relevant criteria and adheres more closely to the time honoured classification principles of mutually exclusive groups and consistent application of identifiable criteria. It also improves on CCLO in a practical way, in that the construction of data relies on a rule based method of coding which ensures a greater consistency and accuracy of coding. (McDonnell et al. 1978; Starrs and Vaughan 1988a, 1988b; Vaughan and Starrs 1987; Walker 1987).

It is important to note that ASCO ranks occupations (at the Major Group level only) in terms of differences in skill level rather than in terms of status differences. This enables the occupational structure to be investigated from a different perspective than that used by studies which rank occupation by status. This study should be considered complementary to those which focus on the question of occupational status.

Fourth, the use of Census data permits the construction of a wide range of relevant measures of labour market endowments (education and labour market experience, English language skills) and socio-economic factors (immigration experience and so on). However, the nature of the data source also means that there are inherent limitations of the type of measures which can be extracted (see Appendix A).

Limitations on this study stem from the fact that it is secondary analysis of data collected for other, more general, purposes, cost and processing restraints arising from the large size of the data sets, and the nature of the explanatory model.

Certain consequences flow from the fact that this is secondary analysis and hence the analysis can only use available variables or those constructed from available variables. The measurement of some variables could be improved for the purposes of this study (see Appendix B). The variable, labour market experience illustrates many of these limitations. Because labour market experience is not measured directly by the Census, it must be constructed from other variables. These other variables (years of education, for example) are themselves somewhat arbitrary. The measure also cannot take account of time spent in vocational training or in the present occupation, since the Census does not collect data on these factors. Hence the measure of labour market experience used here must be considered as a measure of potential, rather than actual, time in the labour market.

As expected with secondary analysis, data are not collected on important factors. In particular, the following factors are not measurable: family background factors (standard of living, parental occupation and education), previous work history (especially, first occupation), personal characteristics relevant to occupational attainment (job preferences, non-certifiable skills such as sociability, motivation, leadership, knowledge of the job market, job search skills, manual dexterity, analytical reasoning and so on). Hence, these factors need to be considered when explaining residual effects.

The large size of the data file (approximately 6.5 million records in the extracted file) influenced the analytical strategy. The choice of logistic regression for the multivariate statistical analysis was made partly on the grounds that it had the capacity to handle large data files efficiently, through the use of weighted data. The costs of dealing with such a large data set also meant that passes through the data had to be kept to a minimum and to some extent influenced the need to develop a parsimonious model early in the data analysis process. Hence, for example, some obvious variables were excluded from the analysis on the grounds of cost and processing difficulties. For example, locality has been excluded because the hierarchical nature of the file structure for Census data meant that extracting this one item would prove difficult and costly. Similarly, the measures of labour market experience overseas and years spent on education overseas had to be excluded because the derivation of the latter proved to be too difficult.

While the model developed here sits firmly within the mainstream of sociological research, it is limited in that it considers only what may be termed the supply side of the labour market equation. The model examines the occupational distribution of groups as the outcome of the distribution of the individual attributes of their members. It takes virtually no account of the demand side of the equation; it does not consider factors such as labour market conditions at the time of first employment and the demand for particular types of workers in particular settings. The model also takes no account of the process by which available workers are selected for occupations (See Granovetter 1981; Sorenson and Kalleberg 1981).

However, within these limitations, the analysis offers the prospect of shedding further light on the question of what influences the occupational distribution of immigrants relative to the Australian born, a question which, although important, has not been subject to extensive research of late.

### 3. Occupation

Occupation is measured by the Major Group level of the Australian Standard Classification of Occupations (ASCO), used by the Australian Bureau of Statistics in the 1986 Census. ASCO is a skill-based classification which groups occupations according to their similarity in terms of the level and specialisation of skill required to perform tasks regarded as primary to the occupations. Conceptually, skill level is defined as the range and complexity of tasks; in practice it is measured by the

amount of formal education, on-the-job training and previous work experience required to perform the primary tasks satisfactorily. The skill specialisation of an occupation is measured in terms of one or more of four variables: the field of knowledge required, the tools and equipment used, the materials worked on and the goods or services produced (Australian Bureau of Statistics 1986; Starrs and Vaughan 1988a, 1988b; Vaughan and Starrs 1987).

ASCO is different from its predecessor and most other occupational classifications in that it does not employ cross-cutting principles in aggregating occupations to groups. The formation of groups is determined by the criteria of skill level and specialisation and does not employ additional confounding criteria such as industry, occupational prestige or status, relationship to the means of production, distribution and exchange, or degree of control. In this sense, ASCO is not based on the relational content of jobs, but rather on the technical division of labour as considered by Griffin and Kalleberg (1981: 5):

Theoretically, occupations are positions in a technical division of labour which perform similar tasks and which have similar training and skill requirements.

However, it is important to note that ASCO uses generally accepted assessments of the skills required in terms of recognized qualifications, training and/or work experience needed for satisfactory performance of tasks. In practice, job entry requirements were often used as an indication of formal education and labour market experience. The equation between generally accepted skill requirements for an occupation and the actual technical requirements of the particular tasks primary to that occupation may not be one of equality. The formal and informal requirements for an occupation may come to exceed the actual level of technical competence, as a result, for example, of the combined effect of technological change reducing the level of expertise needed on the one hand, and occupational groups being able to maintain control over occupational entry requirements on the other (Griffin 1983; Walker 1981). Employers may also require qualifications certifying a level of skill beyond that technically required, because this may enhance the status of the occupation and thus increase its desirability, or qualifications may be seen as reliable evidence of work related attitudes and abilities (for example, general intelligence, diligence, capacity to meet deadlines) (Walker 1987).

It is also clear that some occupational groups, particularly some professions and trades, utilize their position in the production process and other sources of power to regulate entry into the occupation. This often involves government regulation and occupational associations formally requiring certain credentials and may include licensing and registration. This control over entry requirements acts to protect and enhance the income and working conditions of the occupational group (Curtain 1987; Walker 1987). On the other hand, groups which lack sufficient sources of power may fail to be recognized as skilled.

In short, the determination of skills required for satisfactory performance of jobs is socially and politically constructed; it represents the outcome of political and industrial bargaining, the capacity of groups to control entry into particular occupations, and prevailing conceptions of skill. As Curtain puts it,

While some jobs can be generally regarded as skilled or unskilled on the basis of technical competence, other factors to do with strategic position in the production process, the socially accepted view of an occupation (which is often maintained and reinforced by organized representatives of that occupation) and employers' use of qualifications as a general screening device also contribute to what is commonly meant by skill. Skill formation is not merely a technical process which can be related to the length of training (1987: 11).

While there is evidence which indicates that there are disparities between the technical requirements of certain occupations and the labour market requirements, no assessment of the overall extent and pattern of this relationship has been attempted. There are, however, some indications that women, in particular, are disadvantaged by the social and political construction of skill (Curtain 1987; Walker 1987).

The decision to utilize market requirements and prevailing conceptions of skill in developing ASCO was made on three grounds. First, the determination of the skill requirements of all occupations in Australia, independently from those set by the labour market, would have required a massive research effort beyond the resources of the ASCO Project team. Second, the technical assessment of skills independently from qualifications, training and experience, while providing a finer and perhaps more reliable indicator, would equally incorporate prevailing social conceptions of skill; no objective, value free determination of skill is possible. Third, the policy uses of ASCO generated data and the practical use of ASCO for vocational guidance and job matching are better served by a classification based on skill criteria which are related to the Australian education and training systems and to prevailing labour market conditions (see also Docking and Iredale, 1989, and the references cited there for an attempt to evaluate skills of people independently from qualifications and to match these to job entry requirements).

#### **4. The birthplace variable**

As is well known, birthplace is an imperfect guide to ethnic identity and cultural affiliation. A person may be born in one country but mature in another, may be a member of an ethnic or cultural minority within a host society (either as a result of parental immigration or through historical circumstances), or may be a child of displaced persons. Also too, national boundaries change over time. Nevertheless, birthplace is likely to be more objective and reliable than measures of ethnicity and has been used consistently to evaluate the effects of immigration and discrimination.

For the purposes of this study countries of birth have been combined into 6 groups. These groups are based on, firstly, socio-economic and cultural similarity, with Australian culture and language as the reference point, and, secondly, geographical proximity. A further consideration was the need for the groups to contain an adequate proportion of the overseas born population to enable the statistical analysis to be performed efficiently. Notionally 10 per cent of the overseas born population was set as a target figure for the size of these groups.

Because the official language of Australia is English and because Australian culture, society, politics and economy has been Anglo-centric since European settlement, the English speaking countries were first separated out from the rest of the world. These countries are those which are similar to Australia in that English is their lingua franca, they have similar cultural and social traditions and mores, broadly similar economies and forms of political organization. The countries included in this group are the United Kingdom, Ireland, Canada, the United States of America, South Africa, Zimbabwe, New Zealand and Norfolk Island. The inclusion of Canada, even though a large proportion of its population are native French speakers, reflects the fact that the vast majority of Canadian immigrants are from English speaking backgrounds. The inclusion of South Africa and Zimbabwe, arguably at a greater cultural distance from Australia than the rest, reflects the fact that the majority of immigrants from these countries are of Anglo ethnic origin. Hence, it is expected that these immigrants will experience a short and relatively easy adjustment to the Australian cultural environment. The English speaking group is by far the largest of the birthplace groups with 44.5 per cent of the overseas born population.

The remaining groups in the classification, with the exception of the residual group 'Other', were chosen because they met the criteria of cultural similarity and geographical proximity and were sufficiently large enough to warrant separate identification. Attempts to break the groups down any further reduced the proportions to well below 10 per cent of the overseas born population.

With 20.4 per cent of the overseas born population, the Southern Europe group is the largest of the non-English speaking country groups. The countries of Albania, Cyprus, Greece, Italy, Malta, Portugal, Spain, and Yugoslavia comprise this group. Italy is the major contributor to immigration with 8.06 per cent of the

overseas born population, followed by Yugoslavia (4.62%) and Greece (4.23%).

The remaining countries of Europe and the USSR form the next largest group with 14 per cent of the overseas born population. No single country contributes a large proportion of the total.

The countries of Asia make up some 12.5 per cent of the overseas born population.

The remaining countries, included in the residual group, 'Other', contribute nearly 9 per cent of the overseas born population. This group includes the countries of the Middle East (including Egypt) which is the main source of immigrants to Australia in this group with 4.2 per cent of the overseas born population coming from these countries. It also includes the countries in Africa, excluding South Africa and Zimbabwe, Central and South America, and the countries of the Pacific Ocean, excluding Australia, New Zealand and Norfolk Island.

The classification thus has five groups, other than Australia, as follows (percentage of total overseas born at the 1986 Census in brackets):

- (a) English Speaking Countries (44.5%): Canada (0.62%), New Zealand and Norfolk Island (6.54%), South Africa (1.14%), United Kingdom and Ireland (34.71%), United States of America (1.3%), Zimbabwe (0.19%);
- (b) Southern Europe (20.4%): Albania (0.03%), Cyprus (0.73%), Greece (4.23%), Italy (8.06%), Malta (1.73%), Portugal (0.46%), Spain (0.50%), and Yugoslavia (4.62%);
- (c) Other Europe and the USSR (14.02%): Scandinavian countries (0.79%), Eastern Europe, excluding the German Democratic Republic, (3.78%), Western Europe (8.03%), USSR (1.41%);
- (d) Asia (12.5%): China (1.15%), Hong Kong (0.87%) Other Northeast Asia (0.69%), Malaysia (1.47%), Philippines (1.04%), Vietnam (2.56%) Other Southeast Asia (2.39%), India (1.47%), Sri Lanka (0.69%), Other Central Asia (0.20%);
- (e) Other (8.58%): Africa (excluding South Africa and Zimbabwe) (1.07%), Middle East (4.23%), Central and South America (1.68%), Oceania (excluding Australia, New Zealand and Norfolk Island) (1.55%);

TABLE 1. OCCUPATION BY BIRTHPLACE  
(Percentages)

| Major group                               | Australia | English speaking | Southern Europe | Other Europe | Asia    | Other   |
|---|-----------|------------------|-----------------|--------------|---------|---------|
| Managers and administrators               | 12.38     | 10.33            | 9.02            | 11.88        | 7.30    | 8.15    |
| Professionals                             | 11.97     | 13.60            | 3.93            | 12.40        | 16.68   | 9.87    |
| Para-professionals                        | 6.63      | 7.85             | 2.08            | 6.73         | 6.26    | 4.88    |
| Tradespersons                             | 14.62     | 15.77            | 21.34           | 21.27        | 11.78   | 15.80   |
| Clerks                                    | 18.05     | 17.35            | 7.38            | 12.12        | 17.10   | 15.11   |
| Salespersons and personal service workers | 13.05     | 12.30            | 8.13            | 9.60         | 9.71    | 10.62   |
| Plant and machine operators, and drivers  | 7.59      | 7.02             | 16.73           | 8.72         | 9.76    | 11.38   |
| Labourers and related workers             | 13.18     | 13.44            | 28.01           | 14.15        | 18.60   | 20.10   |
| Missing                                   | 2.53      | 2.35             | 3.37            | 3.13         | 2.81    | 4.11    |
| Total numbers                             | 4,832,773 | 761,773          | 356,734         | 226,363      | 183,601 | 152,271 |

## 5. Overview: occupational attainment and birthplace

As revealed by the crosstabulation of ASCO Major Groups by birthplace (Table 1), there are differences between the occupational distribution of the Australian born and the five overseas born groups.

As has been noted previously (see, for example, Evans and Kelley 1986), the occupational profile for the English Speaking Countries closely matches that for the Australian born. The English Speaking Countries group contains slightly fewer Managers and Administrators, Clerks and Sales and Personal Service Workers and slightly more Professionals. Para-professionals and Tradespersons, proportionally than the Australian born.

The occupational profile for Southern European immigrants is very different from that of the Australian born. Indeed of the overseas born groups, this group has an occupational profile which is the greatest distance from that of the Australian born. In the Southern European group there are proportionally fewer Professionals, Para-professionals, Clerks, and Sales and Personal Service Workers and proportionally more Tradespersons, Plant and Machine Operators and Drivers, and Labourers and Related workers. The orientation of the profile is blue collar/ manual work, with a concentration of the workforce in the less skilled occupations.

The profile for those born in the other countries of Europe and the USSR shows some minor differences from that of the Australian born; specifically a slightly greater proportion are employed in trades occupations and a slightly lower proportion in the clerical occupations.

The occupational profile of those born in the countries of Asia shows some differences from that of the Australian born. Asians are somewhat less likely than Australian born to be managers and administrators, and slightly more likely to be professionals and labourers.

Those born in other countries are much more likely to be labourers and somewhat less likely to be managers and administrators, than the Australian born.

To assess the magnitude of these differences I have employed two statistics: the Duncan and Duncan Segregation Index, which measures the proportion of the Australian born or particular country group required to change occupational group to yield equal distributions (Duncan and Duncan 1955a, 1955b); and the usual chi squared statistics, standardized to column percentages (totalled for birthplace group) to compensate jointly for the effect of large overall numbers and the large discrepancy between the total number of Australian born compared to each of the other birthplace groups.

The Segregation Index (Table 2) reveals that the Southern European group differs most from the Australian born, followed, at some distance, by the Asian and the residual groups, then Other Europeans and finally the English Speaking countries. Of these differences, only that involving the Southern European group is significant. This finding reflects the earlier conclusion by Evans and Kelley

(1986: 196) on occupational status : 'Thus, the simple facts of occupational status emphasize the distinctiveness of the Mediterraneans: other immigrants do at least as well as natives, but Mediterraneans do much worse.' In terms of occupations ordered by skill level, only the Southern Europeans stand out as significantly different from the Australian born.

TABLE 2. EXTENT OF OCCUPATIONAL DIFFERENCES

| Country group    | Segregation index | Chi sqd | P (df=7) | Cramer's V |
|------------------|-------------------|---------|----------|------------|
| English speaking | 0.0427            | 0.51    | n.s.     | 0.05       |
| Southern Europe  | 0.3208            | 23.31   | 0.005    | 0.34       |
| Other Europe     | 0.0992            | 0.27    | n.s.     | 0.05       |
| Asia             | 0.1275            | 4.22    | n.s.     | 0.15       |
| Other            | 0.1299            | 4.22    | n.s.     | 0.15       |

Two questions now need to be addressed: first, how can this large difference between Southern Europeans and the Australian born be explained and second, are there significant differences between other overseas born groups and the Australian born which are masked by this overall comparison? Both these questions may be illuminated by considering the prevailing perspectives on the occupational attainment of immigrants.

## 6. Prevailing perspectives and theories

As discussed in the introductory chapter to this paper, the prevailing perspectives on occupational attainment relevant to these questions are first, status attainment and human capital theory, second, the perspective of discrimination, third, ethnic group formation (in particular the notion of ethnic enclaves), fourth, the assimilationist perspective, and fifth, divided labour market theories.

### *Status attainment and human capital theory*

While status attainment theory originated within the sociological tradition and human capital theory within the discipline of economics, both theoretical perspectives have in common that they regard labour market conditions as approximately free and competitive. Hence, occupational attainment will be the product of factors related to job performance. Differences between immigrants and the native born will result from group differences in relevant labour market endowments or human capital characteristics, in particular education and labour market experience. The ability to speak English well is sometimes also included as part of the human capital characteristics; English language skill is essential for the satisfactory performance of primary tasks of some jobs, namely, those involving many and/or complex verbal interactions with Anglophones, such as management, professional, para-professional, selling and clerical jobs.

Empirical studies from this perspective have generally confirmed the importance of labour market characteristics in occupational attainment. However, the studies do not concur on the extent to which differences between immigrant groups and the Australian born group can be accounted for by inter-group differences in human capital characteristics. Evans and Kelley (1986: 199) examined the effect of labour market endowments, including English speaking ability, using 1981 Census data and

concluded that 'differences in the occupational status of immigrants and natives reflect differences in endowments, not discrimination'. Similarly Kelley and McAllister (1984), using data from the ANU 1973 Social Mobility study, found that differences in education accounted for the differences between the Australian born and immigrant groups, except for Mediterraneans. On the other hand, Miller's (1987) analysis of 1981 Census data, while confirming that labour market experience and education raised occupational status, concluded that the overseas born, especially those from non-English speaking countries, were less likely to be located in higher status occupations, even when the effect of education and labour market experience and other factors was held constant. Taken together, these studies indicate that labour market endowments are important factors in occupational attainment, although they may not entirely account for the differences between the overseas and the Australian born.

In addition, immigrants may face particular problems in moving from the labour market of their country of origin to that of Australia. These problems are of two kinds, those associated with the process of resettlement and those related to differences in the respective labour markets. The process of resettlement may cause difficulties and interfere with the basic relationship between human capital characteristics and occupational attainment. Immigrants may lack information about the Australian labour market and may not be equipped with job search skills, especially the ability to speak English effectively. They may be more interested in taking the first available job, thereby gaining some degree of economic security, rather than spending time searching for a job commensurate with their skills. Second, there may be what Stromback (1987) and Inglis and Stromback (1986) term a transferability gap; skills and experience gained in an overseas labour market may not be readily transferable to Australian conditions. Work experience in a subsistence farming economy is not likely to be regarded as relevant to work as a machine operator in a heavy manufacturing plant, for example. Overseas qualifications may not be readily recognized - either formally or informally - as equivalent to Australian qualifications. The effect of this transferability gap is likely to vary by birthplace group, as noted by Iredale (1989: 90): 'In the past the majority of English-speaking migrants gained recognition of their overseas qualifications but around half of those from non-English speaking countries have never been able to return to their pre-migration occupations. Some voluntarily chose to pursue other paths while others have been prohibited from using their qualifications and skills by entry barriers to various occupations.'

A number of empirical studies have investigated the non-transferability of educational qualifications and labour market experience from non-English speaking countries. Kelley and McAllister (1984) and Evans and Kelley (1986), in the studies discussed above, found that highly educated Mediterraneans who obtained their qualifications overseas did not gain occupational status as high as those educated in Australia. They suggest that these lower returns from education may arise from the lower standard of education in these countries, rather than discrimination,

since they did not find that the same difficulty of transferring qualifications applied to Asian immigrants. Miller (1987) also found that education was not particularly rewarding in terms of occupational status for those from non-English speaking countries because educational qualifications were not readily transferable to Australia. Jones (1988: 10-15), in analysing the ABS's 1982 Family Survey, concluded that overseas schooling and labour market experience counted for less than Australian education and experience in raising occupational status. This varied across birthplace groups with immigrants from Britain getting equal value for overseas qualifications and experience, and Italians not gaining equal occupational status returns for overseas qualifications and experience. Studies of income differences have also made similar observations (Stromback 1987, Inglis and Stromback 1986, Chiswick and Miller 1985).

Two hypotheses may be derived from these perspectives: first, the labour market endowments hypothesis, *that differences in the occupational distributions of immigrant groups compared to the Australian born will be the product of inter-group differences in labour market endowments*; and second, the human capital transferability hypothesis, *that the basic relationship between labour market endowments and occupation will be modified by the extent to which these characteristics are transferable to the Australian labour market and by factors relating to the process of resettlement*.

#### *Discrimination*

Another explanation for differences in the occupational attainment of immigrant groups compared to the Australian born is that immigrants are systematically discriminated against in their employment. Social prejudice against ethnic groups may lead to systematic discrimination against immigrants by employers who resist hiring immigrants or who will only employ them in relatively unskilled jobs, by employees who resist working with immigrants, or both. As noted earlier, there is ample evidence that ethnic stereotypes, which would underlie systematic discriminatory behaviour, do exist in the Australian community (Western 1983: 297).

It is not possible to test for discrimination directly using the Census data. It is possible, however, to discount systematic discrimination if it is found that the differences in occupational attainment are the result of other factors. Where this is not the case, as in the studies by Miller (1987) and Jones (1988) discussed above, systematic discrimination remains a possibility. However, discrimination cannot be regarded as proven by these findings because there are always a number of unconsidered factors to take into account (Jones 1988: 11). In this particular case, some important factors (family background, (see Kelley and McAllister 1984) previous work history, and personal characteristics relevant to work performance) were not measurable and others (such as labour market experience) are very imperfect measures.

The discrimination hypothesis is framed thus: *occupational differences between the immigrant groups*

*and the Australian born will remain, even when intergroup differences in labour market endowments are considered.*

If systematic discrimination is based on social prejudice, then discrimination will be stronger against those groups at a greater cultural distance from the prevailing Anglo-celtic majority or who have historically been the subject of social prejudice. The data presented so far suggests that this is not the case; the extent of the difference from the Australian born occupational profile is not greatest for the Asian group, as would be expected, but for the Southern Europeans. Nevertheless, systematic discrimination could be masked by differences among immigrant groups in labour market endowments and other relevant characteristics.

#### *Ethnic enclaves*

The ethnic enclave perspective modifies, rather than replaces the other perspectives. In essence, it is argued that some ethnic groups are able to develop semi-autonomous labour markets. Within these enclaves immigrant entrepreneurs and workers can earn more and obtain better jobs than in the host economy. The enclave thus acts as buffer against discrimination, overcomes to some extent the problem of the non-transferability of skills, qualifications and experience, reduces the disadvantages attendant on the resettlement process and compensates for the lack of effective English language skills.

Indirect evidence suggests that Mediterranean immigrants have the most exclusive ethnic networks in the Australian context (Evans 1987 and see also Bottomley 1979). Evans (1987), using 1981 Census data, establishes that the effect of English language skills on occupational status (holding labour market endowments constant) was significantly greater among East Europeans and third world immigrants than among Mediterranean and Northern Europeans. She concludes that this indicates the effect of ethnic enclaves in insulating some immigrant groups from disadvantages in the wider labour market.

Hence the ethnic enclave hypothesis proposes that *the disadvantageous effects of overseas qualifications and experience, the resettlement process, and especially lack of English language skills will be less for some immigrant groups (Southern Europeans, in particular), than for others.*

#### *Assimilationist perspective*

The assimilationist perspective can be quickly characterized: as migrants come to approximate the host population in terms of language, culture and way of life, then they are more likely to receive equal treatment in labour market. This implies that birthplace groups which are more similar to the prevailing Anglo-celtic culture in Australia will have an occupational profile similar to that of the Australian born, once any differences in labour market endowments are considered.

Evans (1987) holds that the assimilationist perspective also implies that monolingual speakers will (when labour

market endowments held constant) obtain higher status occupations and that the effects of English language ability will be equal across groups. Using 1981 Census data, she does not find this to be so and consequently rejects the assimilationist perspective as an explanation for differences in occupational status.

In addition, the perspective implies that immigrants who were younger at the time of immigration or who have been resident in Australia for longer are more likely to be treated as Australians, since they have had pre-adult exposure to Australian customs and norms or have had longer to become familiar with them.

The assimilationist perspective thus suggests the following hypothesis: *that differences in occupational attainment between immigrant groups and the Australian born will be less among those immigrants who come from birthplace groups similar to the dominant Australian culture, who immigrated as children, have lived in Australia for a longer period, and have a good mastery of the English language.*

#### *Divided labour market theories*

Divided labour market theories, in which I include theories concerning the segmentation of the labour market by ethnicity and the Marxist notion of an industrial reserve army, postulate that the Australian labour market is divided by ethnicity. A typical characterisation is that the Australian born, Anglophonic immigrants and Northern Europeans are in an advantaged position occupying jobs in the tertiary white collar and skilled manufacturing sectors with the highest pay, best conditions, good promotion opportunities and career structures, while immigrants from non-English speaking background are concentrated in unskilled and semi-skilled jobs in the manufacturing, building, and construction sectors where they do hard, dirty work in poor conditions, for low pay, with few prospects for upward job mobility. They are also poorly organized industrially.

This situation is said to arise directly from government policy on immigration, fuelled by the need of employers for unskilled workers to undertake low paid manual work, particularly in manufacturing, and by the interests of privileged workers in maintaining their relative advantages in terms of pay and working conditions. Successive governments, it is argued, have sought skilled labour from Britain and Northern Europe and unskilled labour from Southern Europe, and more recently from Asia. These immigrant groups are poorly organized industrially, being separated from the native born workforce and internally divided by language and cultural differences, and virtually disregarded by a union movement which is concerned to protect the privileges of the Australian born and Anglophones. This isolation from the mainstream trade union movement and lack of organization contributes to perpetuating the labour market division (See Collins 1975, 1976, 1978, 1984a, 1984b; Jakubowicz and Buckley 1975; Lever-Tracy 1981, who argues that immigrant workers are central to the basic relations of capitalism and are not merely quiescent in

industrial relations; O'Malley 1978; Storer 1984; and for a counterview, see Birrell 1984).

The divided labour market theories predict that some immigrant groups (Anglophones, Northern Europeans) will be similar in their occupational attainment to the Australian born, while others (Southern Europeans, Asians and possibly the residual group of 'Other') will be quite different. As described above, this is indeed the situation: immigrants from English Speaking countries and Non-southern Europeans are most like the Australian born; while Southern Europeans, Asians and Others are least like the Australian born.

Thus, the divided labour market hypothesis may be framed as *the differences in occupational attainment between the Australian born and the disadvantaged immigrant groups are the product of government policy to recruit unskilled workers from these countries and that this situation is perpetuated by, inter alia, lack of industrial organization.*

## 7. Independent variables

The following variables were used to analyse the occupational distributions of the birthplace groups: years of education, source of highest qualification, years of labour market experience, age at immigration, duration of residence in Australia and English speaking ability.

### Years of education

Years of education is included as the primary labour market endowment or human capital characteristic relevant to occupational attainment. The distribution of education levels among the different birthplace groups reveals considerable diversity with those from Southern Europe in particular receiving less formal education than other groups (Table 3), as has been observed previously (See Evans 1984). Also of particular interest in the Table is the higher levels of education among Asian immigrants compared to both the Australian born and other immigrant groups.

TABLE 3. YEARS OF EDUCATION BY BIRTHPLACE  
(Percentage)

| Years        | Australia | English speaking | Southern Europe | Other Europe | Asia    | Other   |
|--------------|-----------|------------------|-----------------|--------------|---------|---------|
| <10          | 10.71     | 8.38             | 38.96           | 11.66        | 7.86    | 13.45   |
| 10           | 18.53     | 20.82            | 13.26           | 11.96        | 4.93    | 10.35   |
| 11           | 16.11     | 15.80            | 10.39           | 11.60        | 8.85    | 13.20   |
| 12           | 27.07     | 27.52            | 20.36           | 34.34        | 51.69   | 41.17   |
| 13           | 14.47     | 13.70            | 13.30           | 17.89        | 4.76    | 10.77   |
| 14 +         | 13.11     | 13.78            | 3.73            | 12.54        | 21.92   | 11.06   |
| Total        | 100.00    | 100.00           | 100.00          | 100.00       | 100.00  | 100.00  |
| Total number | 4,723,651 | 700,304          | 317,806         | 197,398      | 167,514 | 140,051 |
| Mean         | 11.55     | 11.59            | 10.67           | 11.72        | 12.06   | 11.59   |

### Source of qualifications

As discussed above, the issue of the transferability of educational qualifications to the Australian labour market has been of particular concern to those writers operating

from the human capital perspective. Hence, qualifications were identified as being obtained in Australia or Overseas (See Appendix B). As can be seen from Table 4, most immigrants who have a post school qualification have obtained their highest qualification in Australia; although a substantial proportion of immigrants from English Speaking countries and from Asia have obtained their highest qualification overseas.

TABLE 4. SOURCE OF HIGHER QUALIFICATIONS  
BY BIRTHPLACE  
(Percentages)

| Source       | English speaking | Southern Europe | Other Europe | Asia   | Other  |
|--------------|------------------|-----------------|--------------|--------|--------|
| Overseas     | 32.77            | 12.97           | 24.31        | 40.13  | 18.95  |
| Australia    | 67.23            | 87.03           | 75.69        | 59.87  | 81.05  |
| Total        | 100.00           | 100.00          | 100.00       | 100.00 | 100.00 |
| Total number | 228,253          | 41,916          | 58,483       | 58,041 | 43,682 |

### Labour market experience

Labour market experience is an essential component of labour market endowments or human capital characteristics. As suggested by status attainment and human capital theories, variations in labour market experience may partly account for inter-group differences in occupational attainment. For this to be possible, there must be substantial variation in the extent of labour market experience across the groups. As shown by Table 5, there is considerable variation between the labour market experience of the Australian born and the different overseas born groups. In particular, immigrants from Southern Europe and Other Europe have considerably greater labour market experience than the Australian born. The lower occupational attainment of the Southern Europeans compared to the Australian born would appear to be difficult to explain in terms of the extent of their labour market experience, as proposed by the labour market endowments hypothesis.

TABLE 5. LABOUR MARKET EXPERIENCE BY  
BIRTHPLACE  
(Percentages)

| Labour market experience | Australia | English speaking | Southern Europe | Other Europe | Asia    | Other   |
|--------------------------|-----------|------------------|-----------------|--------------|---------|---------|
| 35 +                     | 12.12     | 13.29            | 25.98           | 23.40        | 8.24    | 12.24   |
| 25 - 34                  | 14.71     | 20.19            | 26.83           | 23.90        | 15.44   | 18.49   |
| 15 - 24                  | 24.23     | 30.02            | 26.33           | 33.69        | 33.29   | 29.31   |
| 5 - 14                   | 34.46     | 28.42            | 17.07           | 16.07        | 36.43   | 30.41   |
| 0 - 4                    | 14.47     | 8.09             | 3.79            | 2.93         | 6.60    | 9.56    |
| Total                    | 100.00    | 100.00           | 100.00          | 100.00       | 100.00  | 100.00  |
| Total number             | 4,593,260 | 732,874          | 330,515         | 216,361      | 167,324 | 138,056 |
| Mean                     | 17.35     | 19.85            | 25.14           | 24.33        | 17.85   | 19.02   |

### Age at immigration

From the assimilationist and human capital perspectives, the age of the person at the time of immigration is particularly important. Younger immigrants are likely to have come to terms with Australian social conditions and are less likely to experience problems of transferring

human capital characteristics to the Australian labour market. The younger immigrants are more likely to have gained language skills and to have overcome disruptions caused by the immigration experience by the time they enter the labour market. They are also more likely to have been partly or wholly educated in Australia and to have gained their labour market experience in the Australian workforce. Thus, their occupational attainment should be similar to that of the Australian born with similar levels of education and labour market experience. Conversely, adult migrants are likely to have gained their education and most of their labour market experience overseas. This labour market experience may not be relevant to Australian conditions and the qualifications may not be recognized in Australia or may need to be upgraded or supplemented to allow for entry into particular occupations.

With the exception of the Asian born, the age at immigration profile reveals that approximately one third of each group was under the age of fifteen at the time of immigration and hence more able to adapt to Australian social conditions and not experience difficulties in transferring from an overseas labour market (Table 6). For the Asian born, the proportion is somewhat lower, approximately one fifth.

TABLE 6. AGE AT IMMIGRATION BY BIRTHPLACE  
(Percentages)

| Age at immigration | English speaking | Southern Europe | Other Europe | Asia    | Other   |
|--------------------|------------------|-----------------|--------------|---------|---------|
| 50 plus            | 0.96             | 0.26            | 0.62         | 1.84    | 0.95    |
| 40 - 49            | 4.46             | 1.81            | 3.23         | 6.96    | 4.43    |
| 30 - 39            | 17.54            | 10.45           | 12.78        | 21.42   | 15.86   |
| 23 - 29            | 23.20            | 24.95           | 24.00        | 25.95   | 22.71   |
| 19 - 22            | 12.96            | 19.44           | 14.35        | 15.59   | 13.81   |
| 16 - 18            | 5.36             | 10.33           | 5.32         | 9.07    | 7.54    |
| 5 - 15             | 23.71            | 21.78           | 22.90        | 13.61   | 24.14   |
| 0 - 4              | 11.81            | 10.97           | 16.80        | 5.56    | 10.55   |
| Total              | 100.00           | 100.00          | 100.00       | 100.00  | 100.00  |
| Total number       | 747,463          | 345,588         | 221,389      | 180,343 | 115,824 |
| Mean               | 20.74            | 19.23           | 18.90        | 24.46   | 20.60   |

#### Period of residence

Period of residence in Australia is suggested as an important factor in overcoming difficulties in the transfer of experience and qualifications from overseas labour markets, and enabling accommodation to Australian social conditions. It is also considered to be an important factor from the assimilationist perspective, which proposes that those immigrants who have been in Australia longer will have been more able to adjust to Australian cultural norms. In addition, the divided labour market theories imply the opposite prediction, that differences between the occupational attainments of natives and the overseas born will not decrease with the length of time in Australia.

It should also be noted that, as well as indicating the length of time the person has been resident in Australia, this variable also indicates the year of immigration, and thus in part measures the effect of the historical circumstances prevailing at immigration. As argued by the

divided labour market theorists, government policy effects the type of immigrants selected. In particular, their argument would suggest that immigrants who arrived in Australia in the immediate post-war period, that is resident in Australia for thirty or more years, were primarily recruited to work in unskilled manual jobs.

TABLE 7 . PERIOD OF RESIDENCE BY BIRTHPLACE  
(Percentages)

| Period of residence | English speaking | Southern Europe | Other Europe | Asia    | Other   |
|---------------------|------------------|-----------------|--------------|---------|---------|
| 30 or more          | 13.89            | 27.11           | 43.86        | 7.04    | 9.28    |
| 20 - 29             | 25.61            | 36.84           | 24.37        | 9.96    | 15.61   |
| 10 - 19             | 36.55            | 30.56           | 16.52        | 29.75   | 49.59   |
| 5 - 9               | 12.84            | 3.12            | 7.86         | 28.39   | 14.24   |
| 0 - 4               | 11.11            | 2.36            | 7.40         | 24.86   | 11.27   |
| Total               | 100.00           | 100.00          | 100.00       | 100.00  | 100.00  |
| Total number        | 747,491          | 345,610         | 221,431      | 180,349 | 115,829 |
| Mean                | 17.49            | 23.07           | 24.20        | 11.67   | 15.44   |

Differences between the birthplace groups in terms of their period of residence in Australia (Table 7) reflect various historical waves of immigration (See Birrell 1984). The comparatively flatter profile for the English speaking countries reflects the fairly steady immigration from this source. The longer period of residence of Southern and Other Europeans reflects the post-war and subsequent wave of migrants from these sources. The recency of Asian immigrants is highlighted.

#### English speaking ability

English language proficiency has been regarded as the main factor facilitating adaptation to the Australian social environment and the development of local social networks (Bostock 1978). It has also been regarded as a major factor affecting employment of migrants and their occupational attainment (Evans 1984, 1987; Martin 1975; Ware 1974; Zubrzycki 1964).

From the status attainment and human capital perspectives, English language proficiency improves an immigrant's job prospects by enabling the development of job search skills and improving the efficiency of job searching, thus increasing the chances of acquiring an occupation commensurate with skills and education. It also facilitates the acquisition of new skills and knowledge, either through education or vocational training. On the other hand, the lack of English language proficiency may be a positive barrier to some occupations which require good communication skills. In particular, those occupations in Major Groups 1, Managers and Administrators, (with the exception of Farmers and Farm Managers and Managing Supervisors (Other Business)) and 6, Salespersons and Personal Service Workers, require a high level of communication skills.

The disadvantages of a lack of facility with the English language may be offset to some extent by ethnic social networks which can provide a non-English speaker with access to a limited range of job opportunities (Evans 1984, Price 1963, Miller 1982).

The majority of all immigrants from non-English speaking countries identify themselves as speaking English well or better (Table 8). However, a sizable proportion of Southern Europeans and Asians do not regard themselves as being proficient in the English language.

TABLE 8. ENGLISH SPEAKING ABILITY BY BIRTHPLACE  
(Percentages)

| <i>Speaks English</i> | <i>Southern Europe</i> | <i>Other Europe</i> | <i>Asia</i>    | <i>Other</i>   |
|-----------------------|------------------------|---------------------|----------------|----------------|
| Well                  | 81.91                  | 96.23               | 83.89          | 91.18          |
| Not well              | 18.09                  | 3.77                | 16.11          | 8.82           |
| <b>Total</b>          | <b>100.00</b>          | <b>100.00</b>       | <b>100.00</b>  | <b>100.00</b>  |
| <b>Total number</b>   | <b>354,633</b>         | <b>224,738</b>      | <b>182,523</b> | <b>148,891</b> |

### 8. Statistical implications of theories

The different theoretical perspectives discussed above lead to quite different statistical predictions concerning the relationship between occupational attainment, birthplace and the independent variables.

From the status attainment and human capital perspectives, two hypotheses were derived, the labour market endowment and the human capital transfer hypotheses. The labour market endowment hypothesis, that differences in the occupational distributions of immigrant groups compared to the Australian born will be the product of inter-group differences in labour market endowments, leads to the statistical prediction that the relationship between birthplace and occupation will become negligible once years of education and labour market experience are considered, and that labour market endowments will be the primary sources of variation in occupational attainment.

The human capital transferability hypothesis is that the basic relationship between labour market endowments and occupation will be modified by the extent to which these characteristics are transferable to the Australian labour market and/or by factors relating to the process of resettlement. To be tested, the transferability hypothesis requires that education and labour market experience be separated into an overseas and Australian component, and the effects of each examined separately. It was not possible to separate out overseas labour market experience with sufficient precision. As will become apparent, the influence of the source of highest qualification on the basic relationship between occupation and birthplace is confined to the category of those with fourteen or more years of education (i.e. those with tertiary qualifications). Hence it is necessary to utilize age at immigration as a surrogate for separating education and labour market experience into an overseas and Australian component. In terms of these variables, then, the human capital transferability hypothesis implies that the relationship between birthplace and occupation will be inconsequential once the joint effect of years of education, labour market experience and is considered. In addition, the source of highest qualifications may be expected to have a further, but smaller, moderating effect. The second part of the hypothesis which identifies the influence of settlement

factors, implies that the length of residence and English language proficiency will have an additional effect in moderating the relationship between occupation and birthplace.

The discrimination hypothesis that differences in occupational attainment between the overseas born and the Australian born are the result of systematic discrimination implies two conditions. The first condition, which is not essential, but merely supportive, is that the degree of difference between the Australian born and the overseas born groups will be greater for those groups at a greater cultural distance from the prevailing Anglo-celtic culture and for those groups historically the subject of social prejudice in the Australian context. Statistically, this implies that the degree of difference would be ordered from greatest to least as Asians, Southern Europeans, Other Europeans and English Speaking countries. In fact, Southern Europeans are least like the Australian born in terms of occupational attainment, although the remainder of the order holds. The evidence is inconclusive. The second condition, which is necessary, but not sufficient, since it is only possible to test for discrimination by default, is that occupational differences will remain even when labour market endowments and other factors are held constant.

The ethnic enclave hypothesis implies different statistical predictions for different birthplace groups. It proposes that the disadvantageous effects of overseas qualifications and experience, the resettlement process, and especially lack of English language skills will be less for some immigrant groups (Southern Europeans, in particular), than for others. Specifically, for Southern Europeans compared to the Australian born, the relationship between birthplace and occupation will not be reduced by period of residence, English language skills and the source of highest qualification. For other groups these factors will be important.

The assimilationist hypothesis, that differences in occupational attainment between immigrant groups and the Australian born will be less for birthplace groups similar to the dominant Australian culture, implies two conditions. It implies the same order of the degree of difference between the overseas born groups as does the discrimination hypothesis. Similar comments apply; while this condition is not fully satisfied, the order is still compatible with the basic theoretical perspective. More important is the second condition which is that the occupational differences between the overseas born and the Australian born will be significantly less for those immigrants who were young at the time of immigration, have resided in Australia for a longer period, and are skilled English language speakers. Such effects will be net of the impact of labour market endowments. This second condition is likely to apply with greater force to immigrants from those birthplace groups at a greater cultural distance from the dominant Anglo-celtic culture.

Finally, the divided labour market hypothesis, which proposes that the occupational differences are the perpetuated legacy of government policies and the

interests of capital and the Australian born workforce, implies two necessary conditions. The first is that migrants from Southern Europe, Asia and 'Other' countries will remain at the lower end of the occupational scale even when human capital factors are taken into account and this will not be the case for migrants from English Speaking Countries or Other Europe. This may be moderated by the English language factor. Because the divided labour market is perpetuated by lack of English language skills among the disadvantaged birthplace groups, it is predicted that those who do possess English language skills among the disadvantaged groups will be able to partly overcome their disadvantages. The second condition is that the occupational differences, for the disadvantaged groups, will either not be reduced, or will be increased, by the length of residence in Australia. This condition is proposed since the divided labour market is perpetuated even some considerable time after immigrants are recruited.

The first three of these hypotheses - the labour market endowments, the human capital transferability and the discrimination hypotheses - are applicable to explaining differences between overseas birthplace groups and the Australian born individually. Hence their relevance to the analyses will be considered in the discussion concerning each birthplace group. The remaining three hypotheses - the ethnic enclaves, assimilationist and divided labour market hypotheses - have in common that they claim different effects for each birthplace group. Hence, discussion of their relevance will be postponed until all the birthplace groups have been analysed and comparisons between them can be made.

### 9. Statistical analyses

The primary concern of this study is to explore and explain the differences between the overseas and the Australian born in terms of their occupational distribution. Hence the appropriate analytical strategy is first to establish the strength of the relationship between birthplace and occupation by comparing each birthplace group with the Australian born. This has been done by calculating chi squareds and Cramer's V as a measure of association for data standardized to column percentages (i.e. the data is in the form of the percentages of birthplace group in each occupational category). This standardization is necessary to compensate for the joint effect of very large numbers and large discrepancy in size between the Australian born and the overseas born groups. The results of this analysis have been reported above and are repeated for each birthplace group below.

The second step is to analyse the effect of all the variables which separately influence the relationship between birthplace and occupation. The multivariate analysis uses logistic regression (see Appendix 2) which has the advantage of being able to cope with ordinal dependent and independent variables. Because the primary concern is with the relationship between the birthplace variable and occupation, the population for each analysis consists of the Australian born and those born in the particular country group. Model building proceeds by stepwise inclusion of variables with the birthplace dummy variable

forced to be included in the first step. Thereafter variables are chosen according to their capacity to contribute to the model's overall explanatory power. The primary concern is not with the relative importance of the independent variables in affecting the overall occupational distribution but rather the impact that they have jointly and cumulatively on the relationship between birthplace and occupation, in order to test the hypotheses identified above. However, the effect of the independent variables on the occupational distribution of each birthplace group may be assessed by calculating probabilities from the final regression equation (Appendix 2) and this procedure is used to examine the hypotheses further.

### 10. Statistical analysis— English Speaking Countries

Overall, the difference in the occupational distribution of immigrants from English Speaking Countries and the Australian born is quite small. The chi squared analysis of the relationship between birthplace and occupation for the population of the Australian born and those born in English Speaking Countries yielded values of 0.51 for the chi squared (not significant with 7 degrees of freedom) and 0.05 for the Cramer's V. The Duncan-Duncan Segregation Index yields a value of 0.0427, which is the smallest of all the birthplace groups.

The results of the logistic regression in terms of the models' effects on the relationship between birthplace and occupation are presented in Table 9. Overall there is little change in the relationship between birthplace and occupation when the relevant independent variables are controlled for jointly; the final Beta and R values are quite modest as indeed are their starting values. However, it is interesting to observe how the absence of a strong relationship between birthplace and occupation is brought about. Controlling for the effect of the human capital variables (education, labour market experience and the source of qualifications) has the effect of increasing the strength and reversing the direction of the relationship between being overseas born and occupation. While in overall terms, immigrants born in English speaking countries do at least as well, if not slightly better, than Australians in attaining a higher skilled occupation, they do not attain the same level of skilled occupation as the Australian born with similar labour market endowments. Hence, the labour market endowments hypothesis, which predicts that controlling for education and labour market experience would reduce the relationship between occupation and birthplace, must be rejected.

TABLE 9. STEPWISE LOGISTIC REGRESSION ANALYSIS  
ENGLISH SPEAKING COUNTRIES

|      | <i>Variables in the equation<br/>(cumulative to right)</i> |                               |   |                                     |                               |
|------|--|-------------------------------|---|-------------------------------------|-------------------------------|
|      | <i>English<br/>speaking<br/>country</i>                    | <i>Years of<br/>education</i> | <i>Labour<br/>market<br/>experience</i> | <i>Australian<br/>qualification</i> | <i>Age at<br/>immigration</i> |
| Beta | 0.016  | -0.036                        | -0.127                                  | -0.145                              | 0.102                         |
| R    | 0.002  | -0.004                        | -0.012                                  | -0.014                              | 0.004                         |

The stronger negative relationship between birthplace and occupation once labour market endowments are controlled for supports the hypothesis of discrimination. However, once age at immigration is added to the model, the relationship between birthplace and occupation is again close to zero. This conforms to the statistical prediction derived from the human capital transferability hypothesis. It suggests that immigrants from English speaking countries will attain occupations at the same level of skill as the Australian born with similar labour market endowments, provided that their qualifications and much of their labour market experience is gained in Australia. This impression is strengthened by the results from the final regression equation (Table 10); the variables education and Australian qualifications have major effects on occupational attainment, with labour market experience and age at immigration having an important subsidiary effect. Net of education and labour market experience, the source of qualifications and age at immigration are major sources of variation affecting the occupational attainment of English speaking immigrants. This can be illustrated by calculating the predicted probabilities for the population with mean levels of education (11.59 years) and labour market experience (19.85 years) at different levels of age at immigration and source of qualifications and comparing these probabilities with those derived for the Australian born population. The results of these calculations, presented in Table 11, illustrate that, net of education and labour market experience, the differences between English Speaking immigrants and the Australian born is maximized among older immigrants (20-29 years) without higher Australian qualifications and minimized among younger immigrants with higher Australian qualifications. Of the two sources of variation, the source of qualifications is more important in influencing occupational attainment than is the age at immigration.

TABLE 10. LOGISTIC REGRESSION FINAL EQUATION  
ENGLISH SPEAKING COUNTRIES

| <i>Intercepts</i>                        | <i>Beta</i> |
|--|-------------|
| Major group                              |             |
| Managers and administrators              | -4.182      |
| Professionals                            | -3.234      |
| Para-professionals                       | -2.817      |
| Tradespersons                            | -2.023      |
| Clerks                                   | -1.139      |
| Sales and personal service workers       | -0.405      |
| Plant and machine operators, and drivers | 0.193       |
| Variable                                 |             |
| English speaking country                 | 0.102       |
| Years of education                       | 0.558       |
| Labour market experience                 | 0.278       |
| Australian qualification                 | 0.548       |
| Age at immigration                       | -0.076      |

The final value for the birthplace variable also implies that, once relevant factors are considered, the differences between the two groups will be quite small. Again this is illustrated by comparing the predicted probabilities for the 'average' English speaking migrant (Group 3 in Table 11) with those for the Australian born at the same level of education and labour market experience. While the differences are quite small, it is nevertheless the case that migrants from English speaking countries do not attain the

same level of occupational attainment as the Australian born with the same levels of education and labour market experience. This residual difference is largely the result of the 'average' immigrant being 20 to 29 years of age at the time of immigration and hence having gained labour market experience and general education overseas, rather than in Australia.

TABLE 11. PREDICTED PROBABILITIES  
ENGLISH SPEAKING COUNTRIES

| <i>Occupation</i>                        | <i>Group 1</i><br>% | <i>Group 2</i><br>% | <i>Group 3</i><br>% | <i>Group 4</i><br>% | <i>Australian<br/>born</i> |
|--|---------------------|---------------------|---------------------|---------------------|----------------------------|
| Major group                              |                     |                     |                     |                     |                            |
| Managers and administrators              | 10.41               | 12.72               | 16.74               | 20.14               | 21.38                      |
| Professionals                            | 12.66               | 14.61               | 17.42               | 19.29               | 19.86                      |
| Para-professionals                       | 8.21                | 9.01                | 9.89                | 10.27               | 10.34                      |
| Tradespersons                            | 18.89               | 19.46               | 19.47               | 18.91               | 18.62                      |
| Clerks                                   | 15.30               | 14.59               | 13.11               | 11.85               | 11.41                      |
| Sales and personal service workers       | 18.07               | 16.03               | 13.14               | 11.23               | 10.63                      |
| Plant and machine operators, and drivers | 6.68                | 5.62                | 4.33                | 3.57                | 3.34                       |
| Labourers and related workers            | 9.77                | 7.95                | 5.89                | 4.75                | 4.42                       |
| Total                                    | 100.00              | 100.00              | 100.00              | 100.00              | 100.00                     |
| Definitions of Groups                    |                     |                     |                     |                     |                            |
| Years of education                       | 12                  | 12                  | 12                  | 12                  | 12                         |
| Labour market experience                 | 15-24               | 15-24               | 15-24               | 15-24               | 15-24                      |
| Australian qualification                 | No                  | No                  | Aust.               | Aust.               | Aust.                      |
| Age at immigration                       | 20-29               | 0-4                 | 20-29               | 0-4                 | 0                          |

## 11. Statistical analysis - Southern Europeans

Initially the effect of the independent variables on the relationship between occupation and birthplace was examined by controlling for the effect of each independent variable separately. The chi squared analysis of the relationship between birthplace and occupation for the population of Southern Europeans and the Australian born revealed a significant difference overall (chi squared = 23.31, Cramer's V = 0.34).

The results of the multivariate analysis (Table 12) support the human capital transferability hypothesis. As predicted, the relationship between birthplace and occupational attainment remains negative and important while labour market endowments are considered, but becomes negligible once age at immigration is also considered. Unlike the situation with migrants from English Speaking Countries, education reduces somewhat the negative relationship between birthplace and occupation. It should be recalled that, alone of all the birthplace groups, Southern Europeans had lower educational attainment than the Australian born; the effect of education is the result of this. The addition of settlement factors (length of residence and English language proficiency) does not change the relationship; nor does the source of higher qualifications (presumably because it affects relatively few Southern Europeans). The differences between the Southern European born and the Australian born is only partly the product of the lower educational level of the Southern Europeans, but most particularly the result of the

TABLE 12. STEPWISE LOGISTIC REGRESSION ANALYSIS  
SOUTHERN EUROPEAN COUNTRIES

|      | Variables in the equation (cumulative to the right) |                    |                          |                    |                  |                     |                          |
|------|---|--------------------|--------------------------|--------------------|------------------|---------------------|--------------------------|
|      | Southern Europe                                     | Years of education | Labour market experience | Age at immigration | English language | Period of residence | Australian qualification |
| Beta | -0.812  | -0.511             | -0.694                   | 0.277              | 0.225            | 0.299               | 0.310                    |
| R    | -0.054  | -0.034             | -0.046                   | 0.007              | 0.006            | 0.006               | 0.007                    |

non-transferability of education and labour market experience. There is no evidence of systematic cultural discrimination affecting the occupational attainment of Southern Europeans.

The beta values of the final equation (Table 13) lend support to these conclusions, but also point up the important effect of English language proficiency in occupational attainment. Net of education and labour market experience, the source of qualifications and age of immigration are major factors affecting occupational attainment. In addition English language proficiency also has an important effect on occupational attainment.

TABLE 13. LOGISTIC REGRESSION FINAL EQUATION  
SOUTHERN EUROPEAN COUNTRIES

| Intercepts                               | Beta   |
|--|--------|
| Major group                              |        |
| Managers and administrators              | -4.651 |
| Professionals                            | -3.753 |
| Para-professionals                       | -3.357 |
| Tradespersons                            | -2.540 |
| Clerks                                   | -1.689 |
| Sales and personal service workers       | -0.979 |
| Plant and machine operators, and drivers | -0.351 |
| Variable                                 |        |
| Southern Europe                          | 0.310  |
| Years of education                       | 0.544  |
| Labour market experience                 | 0.276  |
| Age at immigration                       | -0.272 |
| English language                         | 0.324  |
| Period of residence                      | 0.050  |
| Australian qualification                 | 0.881  |

The effect of these factors can be illustrated from the predicted probabilities (Table 14). Group 1, Southern Europeans who differ only from the 'average' Southern European in that they do not possess a higher Australian qualification are the least likely to attain a higher skilled occupation. Their occupational profile is least like that of the Australian born with the same level of education and labour market experience. Group 2, non-English speaking Southern Europeans, are also somewhat different from the Australian born in occupational attainment and are less likely to attain a higher skilled occupation, than similarly educated and experienced native Australians. Group 3, Southern Europeans who differ from the average Southern Europeans in that they immigrated as children, have an occupational profile which is indistinguishable from that of the Australian born. Group 4, by contrast, is the 'average' Southern European group and has an occupational profile which is somewhat less skilled than the Australian born and the childhood immigrant group. These predicted profiles illustrate the importance of

Australian higher qualifications and immigrating at a young age for attaining higher skilled occupations in accordance with education and experience. In addition, they demonstrate the importance of English language proficiency in attaining higher skilled occupations. Overall they lend support to the hypothesis of the non-transferability of human capital characteristics.

TABLE 14. PREDICTED PROBABILITIES  
SOUTHERN EUROPEAN COUNTRIES

| Occupation                               | Group 1 | Group 2 | Group 3 | Group 4 | Australian born |
|--|---------|---------|---------|---------|-----------------|
|  | %       | %       | %       | %       |                 |
| Major group                              |         |         |         |         |                 |
| Managers and administrators              | 5.91    | 9.87    | 20.70   | 13.15   | 21.72           |
| Professionals                            | 7.44    | 11.31   | 18.35   | 13.95   | 18.79           |
| Para-professionals                       | 5.29    | 7.36    | 9.73    | 8.49    | 9.80            |
| Tradespersons                            | 15.50   | 18.93   | 19.52   | 19.97   | 19.30           |
| Clerks                                   | 20.69   | 20.44   | 15.16   | 18.98   | 14.68           |
| Sales and personal service workers       | 30.80   | 23.31   | 12.66   | 18.96   | 12.06           |
| Plant and machine operators and, drivers | -3.40   | -2.46   | -1.06   | -1.72   | -1.00           |
| Labourers and related workers            | 17.77   | 11.02   | 4.94    | 8.22    | 4.66            |
| Total                                    | 100.00  | 100.00  | 100.00  | 100.00  | 100.00          |
| Definitions of Groups                    |         |         |         |         |                 |
| Years of education                       | 11      | 11      | 11      | 11      | 11              |
| Labour market experience                 | 25-34   | 25-34   | 25-34   | 25-34   | 25-34           |
| Period of residence                      | 20-29   | 20-29   | 20-29   | 20-29   |                 |
| English language                         | Good    | Poor    | Good    | Good    |                 |
| Australian qualification                 | No      | Aust.   | Aust.   | Aust.   | Aust.           |
| Age at immigration                       | 16-19   | 16-19   | 0-4     | 16-19   |                 |

## 12. Statistical analysis — Other Europeans

Overall, the difference between the occupational distribution of those born in Other Europe and the USSR and those born in Australia is modest and not significant ( $\chi^2 = 3.14$ ;  $V = 0.13$ ; Segregation Index = 0.992).

The results of the multivariate analysis (Table 15) for this group yield a similar picture to that found for Southern European and English Speaking migrants; namely, that controlling for labour market endowments results in a negative relationship between birthplace and occupation, and that the addition of age at immigration results in a near zero relationship, which is not much modified by the addition of other factors. This suggests that the occupational profile of Other Europeans is the result of human capital transferability, rather than labour market endowments or cultural discrimination. This impression is reinforced by consideration of the Beta values for the final logistic regression equation (Table 16). The major factors

TABLE 15. STEPWISE LOGISTIC REGRESSION ANALYSIS  
OTHER EUROPEAN COUNTRIES

|      | <i>Variables in the equation (cumulative to right)</i> |                           |                                 |                           |                         |                            |                                 |
|------|--|---------------------------|---------------------------------|---------------------------|-------------------------|----------------------------|---------------------------------|
|      | <i>Other Europe</i>                                    | <i>Years of education</i> | <i>Labour market experience</i> | <i>Labour immigration</i> | <i>English language</i> | <i>Period of residence</i> | <i>Australian qualification</i> |
| Beta | 0.063  | -0.078                    | -0.306                          | 0.156                     | 0.122                   | 0.054                      | 0.077                           |
| R    | 0.004  | -0.005                    | -0.017                          | 0.004                     | 0.003                   | 0.001                      | 0.002                           |

affecting occupational attainment are English language proficiency, education, an Australian higher qualification, labour market experience and age at immigration. Period of residence plays a minor role in occupational attainment.

TABLE 16. LOGISTIC REGRESSION FINAL EQUATION  
OTHER EUROPEAN COUNTRIES

| <i>Intercepts</i>                        | <i>Beta</i> |
|--|-------------|
| Major group                              |             |
| Managers and administrators              | -4.739      |
| Professionals                            | -3.818      |
| Para-professionals                       | -3.412      |
| Tradespersons                            | -2.613      |
| Clerks                                   | -1.740      |
| Sales and personal service workers       | -1.013      |
| Plant and machine operators, and drivers | -0.406      |
| Variable                                 |             |
| Other European                           | 0.077       |
| Years of education                       | 0.551       |
| Labour market experience                 | 0.278       |
| Age at immigration                       | -0.164      |
| English language                         | 0.954       |
| Period of residence                      | -0.068      |
| Australian qualification                 | 0.418       |

The impact of these different factors can be illustrated by reference to the derived probabilities expressed as occupational profiles for groups with different characteristics (Table 17). Other Europeans who differ from the average only in that they are not good English speakers have an occupational profile which differs from English speaking Other Europeans (Group 1 compared to Group 3) and the Australian born in being concentrated in the less skilled levels; they are, for example, three times less likely to be Managers and Administrators, and three times more likely to be Labourers and Related Workers than the Australian born. Having an Australian higher qualification also makes a considerable impact on the chances of attaining a higher skilled occupation; immigrants without an Australian higher qualification (Group 2) are two times less likely to attain a managerial or professional occupation and twice as likely to be employed as a labourer or related worker than the Australian born. Other European immigrants who differ from the average in that they immigrated as children (Group 4) have an occupational profile which is indistinguishable from that of the Australian born, while those who immigrated as older teenagers (16 to 19 years, the range incorporating the mean for the group) have an occupational profile which is somewhat less skilled than that for the Australian born with similar levels of education and experience.

TABLE 17. PREDICTED PROBABILITIES  
OTHER EUROPEAN COUNTRIES

| <i>Occupation</i>                        | <i>Group 1</i><br>% | <i>Group 2</i><br>% | <i>Group 3</i><br>% | <i>Group 4</i><br>% | <i>Australian born</i> |
|--|---------------------|---------------------|---------------------|---------------------|------------------------|
| Major group                              |                     |                     |                     |                     |                        |
| Managers and administrators              | 6.10                | 10.00               | 14.44               | 18.98               | 18.23                  |
| Professionals                            | 7.94                | 11.83               | 15.34               | 18.08               | 17.68                  |
| Para-professionals                       | 5.64                | 7.69                | 9.10                | 9.84                | 9.76                   |
| Tradespersons                            | 15.58               | 18.69               | 19.69               | 19.35               | 19.47                  |
| Clerks                                   | 21.33               | 20.82               | 18.62               | 16.20               | 16.59                  |
| Sales and personal service workers       | 16.38               | 13.16               | 10.32               | 8.33                | 8.53                   |
| Plant and machine operators, and drivers | 10.22               | 7.24                | 5.27                | 4.01                | 4.18                   |
| Labourers and related workers            | 16.81               | 10.57               | 7.22                | 5.31                | 5.56                   |
| Total                                    | 100.00              | 100.00              | 100.00              | 100.00              | 100.00                 |
| Definitions of Groups                    |                     |                     |                     |                     |                        |
| Years of education                       | 12                  | 12                  | 12                  | 12                  | 12                     |
| Labour market experience                 | 15-24               | 15-24               | 15-24               | 15-24               | 15-24                  |
| Australian qualification                 | Aust.               | No                  | Aust.               | Aust.               | Aust.                  |
| Period of residence                      | 20-29               | 20-29               | 20-29               | 20-29               | 20-29                  |
| English language                         | Poor                | Good                | Good                | Good                | Good                   |
| Age at immigration                       | 16-19               | 16-19               | 16-19               | 0-4                 |                        |

These findings reinforce the conclusions derived from the stepwise analysis, namely that differences in the occupational attainment of Other Europeans and the Australian born are primarily the result of the difficulties of transferring education and labour market experience to the Australian context. In addition, English language proficiency plays a major role in affecting the occupational attainment of Other Europeans.

### 13. Statistical analysis — Asian born

Overall, there is no significant difference between the occupational profiles of the Australian and Asian born ( $\chi^2 = 4.22$ , not significant with 7 degrees of freedom, Cramer's  $V = 0.15$ , Segregation index = 0.1275 which is moderate).

The results of this multivariate analysis (Table 18) reveal a different picture from that of the other birthplace groups. While taking education and labour market experience into account increases the size of the negative relationship between birthplace and occupation for the Asian born, this is slightly modified by additionally introducing English language proficiency into the model. While overall the difference between the Asian and the Australian born is not large, that difference is increased once education and labour market experience are jointly taken into account. Unlike the situation with the other birthplace groups, age

TABLE 18. STEPWISE LOGISTIC REGRESSION ANALYSIS ASIAN COUNTRIES

|      | <i>Variables in the equation (Cumulative to right)</i> |                           |                                 |                         |
|------|--|---------------------------|---------------------------------|-------------------------|
|      | <i>Asian born</i>                                      | <i>Years of education</i> | <i>Labour market experience</i> | <i>English language</i> |
| Beta | -0.181   | -0.453                    | -0.522                          | -0.384                  |
| R    | -0.009   | -0.023                    | -0.026                          | -0.018                  |

at immigration and the source of higher qualifications do not modify this negative effect of controlling for education and labour market experience. Thus the disadvantages experienced by the Asian born in terms of occupational attainment do not appear to be largely the product of the difficulties in transferring human capital characteristics from another labour market to the Australian context. Rather it would seem that these disadvantages are the result of cultural discrimination. The slightly moderating influence of English language proficiency on the relationship between birthplace and occupation adds to this impression. The results of the final logistic regression equation (Table 19) confirm the general thrust of these observations.

TABLE 19. LOGISTIC REGRESSION FINAL EQUATION ASIAN COUNTRIES

| <i>Intercepts</i>                        | <i>Beta</i> |
|--|-------------|
| Major group                              |             |
| Managers and administrators              | -5.203      |
| Professionals                            | -4.264      |
| Para-professionals                       | -3.858      |
| Tradespersons                            | -3.078      |
| Clerks                                   | -2.194      |
| Sales and personal service workers       | -1.466      |
| Plant and machine operators, and drivers | -0.860      |
| Variable                                 |             |
| Asian born                               | -0.384      |
| Years of education                       | 0.552       |
| Labour market experience                 | 0.278       |
| English language                         | 1.062       |

However, while the introduction of English language proficiency into the equation only slightly reduces the relationship between occupation and birthplace, it is of major importance in affecting the occupational attainment of the Asian born - indeed its influence outweighs that of education and experience. Using the predicted probabilities illustrates the major importance of English language ability on occupational attainment; those who do not speak English well (Group 1 in Table 20) are four times less likely to be managers and administrators and three times more likely to be labourers and related

workers than the Australian born. By contrast, the occupational profile for those who are good English speakers (Group 2) is only slightly different from that of the Australian born at the same level of education and labour market experience.

TABLE 20. PREDICTED PROBABILITIES ASIAN COUNTRIES

| <i>Occupation</i>                        | <i>Group 1 %</i> | <i>Group 2 %</i> | <i>Australian born</i> |
|--|------------------|------------------|------------------------|
| Major group                              |                  |                  |                        |
| Managers and administrators              | 2.03             | 5.67             | 8.01                   |
| Professionals                            | 3.01             | 7.66             | 10.30                  |
| Para-professionals                       | 2.39             | 5.54             | 7.03                   |
| Tradespersons                            | 7.38             | 14.62            | 17.04                  |
| Clerks                                   | 14.81            | 21.43            | 21.64                  |
| Sales and personal service workers       | 16.96            | 16.71            | 14.62                  |
| Plant and machine operators, and drivers | 14.91            | 10.59            | 8.41                   |
| Labourers and related workers            | 38.49            | 17.79            | 12.85                  |
| Total                                    | 100.00           | 100.00           | 100.00                 |
| Definitions of Groups                    |                  |                  |                        |
| Years of education                       | 12               | 12               | 12                     |
| Labour market experience                 | 15-24            | 15-24            | 15-24                  |
| English language                         | Poor             | Good             |                        |

#### 14. Statistical analysis — Other Countries

Overall there is a small and not significant difference between the Australian born and those born in 'Other' countries ( $\chi^2 = 4.22$ ,  $V = 0.15$ ; segregation index 0.1299).

As has been found for the other groups, controlling for the influence of education and labour market experience results in a stronger negative relationship between birthplace and occupation. This negative relationship is made positive and close to neutral by the addition of age at immigration (Table 21). This confirms the human capital transferability hypothesis, rather than the hypotheses of discrimination or labour market endowments.

The Beta values in the final logistic regression equation indicate that the major influences on occupational attainment, apart from education and labour market experience, are English language proficiency, Australian higher qualifications and age at immigration (Table 22). Evaluating the effects of the various factors by means of the derived predicted probabilities indicates that immigrants from Other Countries with an education level and labour market experience close to the mean for their

TABLE 21. STEPWISE LOGISTIC REGRESSION ANALYSIS OTHER COUNTRIES

|      | <i>Variables in the equation (cumulative to right)</i> |                           |                                 |                           |                         |                                 |                            |
|------|--|---------------------------|---------------------------------|---------------------------|-------------------------|---------------------------------|----------------------------|
|      | <i>Other country</i>                                   | <i>Years of education</i> | <i>Labour market experience</i> | <i>Age at immigration</i> | <i>English language</i> | <i>Australian Qualification</i> | <i>Period of Residence</i> |
| Beta | -0.399   | -0.513                    | -0.566                          | 0.300                     | 0.246                   | 0.266                           | 0.467                      |
| R    | -0.016   | -0.021                    | -0.023                          | 0.005                     | 0.004                   | 0.004                           | 0.006                      |

**TABLE 22. LOGISTIC REGRESSION FINAL EQUATION  
OTHER COUNTRIES**

| <i>Intercepts</i>                        | <i>Beta</i> |
|--|-------------|
| Major group                              |             |
| Managers and administrators              | -5.307      |
| Professionals                            | -4.383      |
| Para-professionals                       | -3.978      |
| Tradespersons                            | -3.190      |
| Clerks                                   | -2.307      |
| Sales and personal service workers       | -1.576      |
| Plant and machine operators, and drivers | -0.969      |
| Variable                                 |             |
| Other country                            | 0.467       |
| Years of education                       | 0.552       |
| Labour market experience                 | 0.279       |
| Age at immigration                       | -0.211      |
| English language                         | 0.677       |
| Australian qualification                 | 0.595       |
| Period of residence                      | 0.100       |

group who also are good speakers of English, have gained a higher Australian qualification and who immigrated as children are only slightly less likely than the Australian born with similar characteristics to attain a higher skilled occupation (Group 4 in Table 23 compared to the Australian born). The 'average' immigrant, (Group 3) who differs from this Group only in being somewhat older at the time of immigration, by comparison, is somewhat less likely to attain a higher skilled occupation than the Australian born. Immigrants with either poor English language skills (Group 1) or without an Australian higher qualification (Group 2) are at a considerable disadvantage compared to their fellow immigrants and the Australian born with the same levels of education and experience; they are nearly three times less likely to attain a managerial or administrative occupation and nearly three times more likely to be employed as a labourer or related worker, than are the Australian born.

**TABLE 23. PREDICTED PROBABILITIES  
OTHER COUNTRIES**

| <i>Occupation</i>                        | <i>Group 1</i> | <i>Group 2</i> | <i>Group 3</i> | <i>Group 4</i> | <i>Australian Born</i> |
|--|----------------|----------------|----------------|----------------|------------------------|
|  | %              | %              | %              | %              |                        |
| Major group                              |                |                |                |                |                        |
| Managers and administrators              | 6.44           | 6.95           | 11.93          | 20.33          | 21.04                  |
| Professionals                            | 8.33           | 8.88           | 13.51          | 18.79          | 19.12                  |
| Para-professionals                       | 5.86           | 6.17           | 8.41           | 9.96           | 10.00                  |
| Tradespersons                            | 15.74          | 16.28          | 19.10          | 18.86          | 18.72                  |
| Clerks                                   | 21.64          | 21.70          | 20.71          | 15.72          | 15.37                  |
| Sales and personal service workers       | 16.15          | 15.71          | 11.85          | 7.74           | 7.50                   |
| Plant and machine operators, and drivers | 9.88           | 9.41           | 6.24           | 3.72           | 3.58                   |
| Labourers and related workers            | 15.95          | 14.90          | 8.80           | 4.87           | 4.67                   |
| <b>Total</b>                             | <b>100.00</b>  | <b>100.00</b>  | <b>100.00</b>  | <b>100.00</b>  | <b>100.00</b>          |
| Definitions of Groups                    |                |                |                |                |                        |
| Years of education                       | 12             | 12             | 12             | 12             | 12                     |
| Labour market experience                 | 15-24          | 15-24          | 15-24          | 15-24          | 15-24                  |
| Period of residence                      | 10-19          | 10-19          | 10-19          | 10-19          |                        |
| English language                         | Poor           | Good           | Good           | Good           |                        |
| Australian qualification                 | Aust.          | No             | Aust.          | Aust.          |                        |
| Age at immigration                       | 20-29          | 20-29          | 20-29          | 0-4            |                        |

## 15. Overview

For all immigrant groups the relationship between birthplace and occupation becomes increasingly negative once education and labour market experience is considered. Immigrants are less likely to attain as highly skilled an occupation as Australian born with similar levels of education and labour market experience. For all immigrant groups, except the Asian born, the relationship approached zero once age at immigration was also considered. Examination of the final logistic regression equations and the derived predicted probabilities indicated that, for all groups except the Asian born, the major factors affecting occupational attainment were education and the source of qualifications, with labour market experience and age at immigration being of secondary importance. In addition, for all non-English speaking country groups, English language proficiency was a major influence on occupational attainment. Hence it was concluded that the non-transferability of human capital characteristics, education and labour market experience, was the primary explanation for variations in occupational attainment among immigrant groups, except the Asian born. In the case of the Asian born, occupational attainment is affected by education, labour market experience and English language proficiency. However, controlling for the effects of labour market endowments alone has the effect of increasing the negative relationship between being Asian born and higher skilled occupational attainment. This relationship is only slightly reduced by the addition of English language proficiency into the equation. Hence, it was concluded that cultural discrimination was the overriding mechanism explaining the occupational attainment of the Asian born.

This general picture is incompatible with the three comparative hypotheses outlined earlier. The assimilationist hypothesis predicted that, particularly among those birthplace groups at a greater cultural distance from the dominant Anglo-celtic culture, age at immigration, period of residence and English language skills would contribute to the relationship between birthplace and occupation. The pattern of effects would suggest otherwise. Age at immigration has a moderate general effect on occupational attainment for all groups except the Asian born who are arguably at a greater distance from the dominant culture. Period of residence is of little consequence for all groups, but especially for the Asian born. English language ability has the greatest consequences for the Asian born, as predicted, but also for Other Europeans as well (See below). On balance, this hypothesis should be rejected.

The divided labour market hypothesis predicted that the Southern Europeans, Asians and Others would differ from the English speaking Countries group and Other Europeans in that they would remain occupationally disadvantaged when human capital factors were taken into account. Among the disadvantaged group, the length of residence in Australia would serve to increase the difference between the overseas and the Australian born while English language skills would moderate the relationship. This does not seem to be the case. The birthplace groups do not divide as predicted; the main

difference is between the Asian born (partial R between Asian born and occupation = -0.018) and the Other birthplace groups (all who have partial Rs which are positive and close to zero). Period of residence is not a significant factor affecting occupational attainment and English language proficiency has major effects among the Other Europeans, as it does among all non-English speaking country groups. Indeed its effects are greater among the Other Europeans than among the Southern Europeans and the 'Other' immigrants (see below).

The ethnic enclaves hypothesis predicted that the relationship between birthplace and occupation would not be reduced by the introduction of period of residence, English language skills and the source of highest qualification among those birthplace groups (Southern Europeans and possibly Other Europeans) which have developed ethnic enclaves. Although it is the case, as predicted by the hypothesis, that these variables do not affect the relationship between birthplace and occupation among Southern Europeans and Other Europeans, this also applies to the immigrants from 'Other Countries'. For the Asian born, similarly, period of residence and the source of qualifications do not affect the birthplace-occupation relationship, although the introduction of English language skills does reduce the extent of the negative relationship between birthplace and occupation. In other words, it is the Asian born, not the Southern Europeans and Other Europeans who stand out as distinctive. In terms of the effects of the variables, period of residence is of minor importance for both European and 'Other' groups and of no importance for the Asian born. The source of qualifications is of relatively greater importance among the Southern Europeans than among the Other Europeans or 'Other' immigrants; it is of no consequence for the Asian born. Comparing the relationships between English language skills and occupation from the multivariate analysis indicates strongly the distinctiveness of the Asian born. The partial Rs for that relationship are: Southern Europeans 0.008; Other Europeans 0.009; Asian 0.018; and Other Countries 0.008. Hence, the ethnic enclaves hypothesis must be rejected as an explanation of the relationship between birthplace and occupation.

## 16. Conclusion

This analysis has shown that the differences in occupational attainment between the overseas born (with the notable exception of the Asian born) and the Australian born are largely the product of the difficulties of transferring human capital characteristics (education and labour market experience) to the Australian labour market. Immigrants who are young at the time of immigration, who have obtained higher qualifications in Australia and who have a good standard of English are much more likely to attain an occupation at a level of skill commensurate with their qualifications and experience, than immigrants who do not have these characteristics. In broad outline, this study confirms previous findings by

Kelley and McAllister (1984), Evans and Kelley (1986), Miller (1987) and Jones (1988). The main difference between this study and these previous studies is that here the issue of non-transferability of human capital characteristics appears to be more widespread. However, it should be noted that, as found previously, the consequences of non-transferability are more serious for immigrants from non-English speaking countries than they are for those from English speaking countries.

That the problem of transferability is not confined to the Southern Europeans indicates that the explanation put forward by Kelley and McAllister (1984) and Evans and Kelley (1986), that the educational standard of these countries is somewhat lower than the Australian standard, cannot apply to the present data. Rather what it does suggest is that there is a general discounting of both overseas education and labour market experience. Two explanations seem plausible at this point. First, it may be the case, as argued by Iredale (1989) and Jakubowicz and Buckley (1975), that immigrants lack sufficient knowledge about the Australian job market and the job search process to be able to attain an occupation at the appropriate skill level effectively and quickly. Since immigrants have an immediate economic necessity to obtain a job quickly, they may accept a job at a lower skill level and become locked in to that pattern of employment. Second, employers may not regard overseas qualifications, training and experience as being as relevant to Australian occupations as Australian equivalents. A number of reasons why this might be the case can be proposed: employers may have the mistaken belief that overseas education and experience is not worth as much as Australian education and experience; employers may be uninformed about overseas education and working environments and prefer to 'play it safe' when it comes to hiring adult migrants; employers may correctly assess that the overseas education and experience does not match Australian occupational requirements (for example, adult migrants may be overqualified and overskilled for the work available). While the present study offers no clear choices among these alternatives, it does indicate that the task of matching the work skills of adult immigrants to the skill based gaps in the Australian workforce is a complex task, which is not being achieved with sufficient success to ensure that occupational differences between the Australian born and immigrant groups are minimized.

The Asian born are an exception to the generalization that the differences between the Australian and overseas born are mainly the product of the non-transferability of human capital resources; here the difference seems to be the product of cultural, rather than economic, discrimination. As noted in the Introduction, discrimination is difficult to establish in a study such as this, except by the absence of other causes; hence it would be unwise to assert this conclusion with too much force on the basis of the evidence presented here.

## APPENDIX A

### AUSTRALIAN STANDARD CLASSIFICATION OF OCCUPATIONS

ASCO is a hierachic classification and is composed of four levels: Major Group, Minor Group, Unit Group and Occupation. At the Major Group level, groups are separated principally according to skill level; at the lower levels the skill specialisation criteria are applied in successively finer degrees of detail. Eight Major Groups are distinguished in the classification on the basis of skill level. In descending order of skill level, these are: 1 Managers and Administrators; 2 Professionals; 3 Para-professionals; 4 Tradespersons; 5 Clerks; 6 Salespersons and Personal Service Workers; 7 Plant and Machine Operators, and Drivers; 8 Labourers and Related Workers.

Major Group One, Managers and Administrators, includes occupations with the highest level of skill, commensurate with a three year degree and five to ten years of previous relevant work experience. Tasks performed in these occupations are broad ranging and complex and require good understanding of a range of matters and a high level of judgement: "Tasks performed by Managers and Administrators typically include formulating, administering and reviewing the policy and/or legislation which determine the direction to be taken by the body they head; controlling, directing and participating in the activities of that body personally or though a hierarchy of subordinate managers and supervisors; establishing operational and administrative procedures; and controlling the selection of senior staff and the allocation of resources." (Australian Bureau of Statistics, 1986: 65). In addition to legislators and government appointed officials, and general and specialist managers, this group includes farmers and farm managers, and managing supervisors who "head establishments too small to have a hierarchy of managers...[and who]...co-ordinate all functions of such establishments." (Australian Bureau of Statistics 1986: 75 and 78).

Professional occupations, which comprise Major Group Two, have a level of skill commensurate with a three year degree (or longer), but do not require the extensive previous work experience of occupations in Major Group One. It includes scientists, engineers, architects, medical practitioners, school teachers, various social and business professionals, artists and related occupations. People in these occupations "...perform analytical, conceptual and creative tasks requiring a high level of intellectual ability and thorough understanding of an extensive body of theoretical knowledge." (Australian Bureau of Statistics 1986: 79).

Para-professional occupations in Major Group Three, by contrast, consist of those occupations where people perform "...complex technical tasks requiring the understanding of a body of theoretical knowledge and significant practical skills" (Australian Bureau of Statistics, 1986: 109) and require a level of skill

commensurate with a two to 3 year certificate or associate diploma, and in many cases additional on-the-job training. It includes various technical officers and technicians (for example, laboratory technicians, civil engineering associates, air traffic controllers, ships' captains, and marine engineers), aircraft pilots, nurses (except enrolled nurses), police, ambulance officers and prison officers.

Major Group 4, Tradespersons, includes the recognized trade occupations with a level of skill characterized by a four year trade certificate, usually obtained by apprenticeship (Australian Bureau of Statistics 1986: 125).

By contrast, the occupations grouped together in Major Group 5, Clerks, have a slightly lower level of skill, commensurate with Years 11 and 12 at secondary school plus six months on-the-job training. It includes occupations such as stenographer, office secretary, typist, data entry operator, bookkeeper, filing clerk, stock clerk, receptionist, messenger and teachers' aide (Australian Bureau of Statistics 1986: 155-168).

Major Group Six, Salespersons and Personal Service Workers, comprises those occupations where the primary task is selling or providing a personal service. While most occupations in this group require a level of skill equivalent to Year Ten at secondary school plus three month on-the-job training, some (for example, securities and finance dealers, dental nurses) require higher qualifications. The group includes occupations such as real estate salespersons, sales representatives, sales assistants, bar attendants, waiters, kindergarten assistants and enrolled nurses (Australian Bureau of Statistics 1986: 169-180).

Major Group Seven, Plant and Machine Operators and Drivers, includes those occupations where the primary tasks concern the operation of vehicles or other large equipment. No formal education or previous experience is usually required, the necessary skill being acquired through on-the-job training ranging from 3-24 months. It includes drivers of buses, trams, cars, trucks, locomotives and forklifts, operators of excavating and earth-moving equipment, agricultural machinery, power generating plants, cranes, and production machinery (Australian Bureau of Statistics 1986: 181-200).

Major Group Eight, Labourers and Related Workers, includes those occupations where the primary tasks are usually routine and carried out manually or with the assistance of hand tools and appliances. No formal qualifications or previous work experience is required, but some on-the-job training (up to 12 months) may be required. It includes trades assistants, farm hands, forestry labourers, cleaners, building and construction labourers, storemen/women, and kitchen hands (Australian Bureau of Statistics 1986: 201-216).

## APPENDIX B

### VARIABLE SPECIFICATIONS

#### **Occupation**

Occupation is measured by the Australian Standard Classification of Occupations (ASCO) at the Major Group Level. It is derived from the Census variable OCC.

##### Asco major group

1. Managers and Administrators
2. Professionals
3. Para-professionals
4. Tradespersons
5. Clerks
6. Salespersons and Personal Service Workers
7. Plant and Machine Operators and Drivers
8. Labourers and Related Workers

The interpretation of these groups is discussed fully in the Statistical Classification (Australian Bureau of Statistics 1986).

#### **Birthplace**

*Birthplace* has 6 categories of country groups, derived from the Census variable BPL, as follows:

##### GROUP (Census Categories)

###### Australia (Australia)

English Speaking Countries (Canada, Ireland, New Zealand, Norfolk Island, South Africa, United Kingdom, United States of America, Zimbabwe)

Southern European Countries (Albania, Cyprus, Greece, Italy, Malta, Portugal, Spain, Yugoslavia, Other Southern Europe)

Other European Countries and the USSR (Other Europe, USSR)

Asian Countries (Christmas Island, Cocos (Keeling) Islands, Eastern Asia, South Eastern Asia, Southern Asia)

Other Countries (Africa excluding South Africa and Zimbabwe, West Asia excluding Cyprus, South America, Other America excluding Canada and the United States, Oceania excluding Australia, New Zealand and Norfolk Island)

Countries have been regrouped according to three criteria, socio-cultural similarity, geographical proximity, and proportionate size of the overseas born population.

#### **Years of education**

Years of education is the level of education qualifications and schooling translated into typical years of full time education. The variable has the range 0 - 18 years. However no case has the values 1-6 or 17.

| <i>Qualification</i>                     | <i>Years</i> |
|--|--------------|
| Higher degree                            | 18           |
| Graduate diploma                         | 16           |
| Bachelor degree                          | 15           |
| Diploma                                  | 14           |
| Trade certificate                        | 13           |
| Other certificate                        | 12           |
| Not classifiable                         | 0            |
| Not recognized or inadequately described | 0            |
| No qualifications                        | 0            |
| Not stated                               | 0            |

For those with no qualifications, that is 0 above, Years of Education equals *Age left school* - 5. Individuals with a stated school leaving age of 18 or more years are assigned 12 years of education.

This variable is derived from Census variables on age left school ("ALS") and Highest qualification ("QAL").

#### **Source of highest qualification**

This is a two category variable indicating whether or not the highest post-secondary qualification was obtained in Australia.

There is no direct measure of the source of highest qualification. Although data on the name of institution from which post school qualifications were obtained is collected, these data are used only for coding purposes and not retained. In the absence of this information, the source of qualifications is obtained as follows.

Source of highest qualifications is derived from the Census variables Year Qualification Obtained (YOQ) and Period of Residence (PER), after PER has been recoded to the same year groups as YOQ. For the overseas born with post secondary qualifications, if the period of residence year group is the same as or exceeds the year group in which the qualification was obtained, then the qualification is deemed to be obtained in Australia; if the period of residence is less than the year of qualification, then the qualification is deemed to be obtained overseas. For the Australian born, the highest qualification is deemed to be an Australian qualification.

There are two obvious shortcomings with this measure. Because the year in which the qualification is obtained is only recorded in, mainly, five year bands, there is no reliable way to determine whether a qualification was obtained prior to, or after, arrival in Australia, when the year ranges for arrival and obtaining a qualification are the same. I have adopted the convention of assuming that in this case the qualification was obtained in Australia; this convention would have the effect of raising the proportion of qualifications deemed to be Australian.

The second shortcoming is that there is no way to assess the proportion of Australians who have obtained

qualifications overseas. Data on this would provide a more robust test of the thesis that overseas qualifications do not yield as high a level of occupational attainment as Australian qualifications.

#### **Labour market experience**

Labour market experience is measured as years of potential experience in the labour market.

The Census does not include any direct measure of labour market experience or of the time spent in the current job, in vocational training, or out of the workforce. Hence, it is only possible to obtain a crude estimate of nett potential labour market experience, as opposed to actual workforce experience. It is, however, possible to discount women's labour market experience for the time probably lost through childbirth. Two formulae are used to estimate potential labour market experience:

1. For males:  $\text{Labour market experience} = \text{age} - \text{years education} - 5$

2. For females:  $\text{Labour market experience} = \text{age} - \text{years education} - 5 - (2 * \text{number of children born})$

Labour Market Experience is derived from the Census variables *Age* and *Total issue living* (TIS), and the constructed variable *Years of education*.

#### **Age at immigration**

The age of the overseas born at the time of immigration is derived from the Census items, *Age* and *Period of Residence*, by subtracting period of residence from age.

#### **Period of residence**

The length of time since arrival in Australia is measured by the Census variable PER. PER measures period of residence in single years from 1 to 39 years and more than 40 years as 40.

#### **English language proficiency**

This is measured by a two category variable indicating whether the overseas born (apart from those from English Speaking Countries) speaks English well or better or speaks English not at all well, taken from the Census variable Proficiency in English (ENG).

## APPENDIX C

### LOGISTIC REGRESSION

Logistic multiple regression was chosen for this study because it offers the following advantages: (1) it is suitable for use with an ordinal dependent variable, such as occupation classified to the ASCO Major Group level, unlike ordinary least squares regression; (2) it preserves the order inherent in the dependent variable categories, unlike multinomial logit (see Miller and Volker 1985a); (3) it makes a clear distinction between dependent and independent variables, unlike log linear models; and (4) it was readily available under the SAS system used by the ABS.

In a logistic regression, the dependent variable is a logit, or the natural logarithm of the probability of being, in the case of an ordinal dependent variable such as occupational skill level groups, in a higher rather than a lower category. The probability (conditional on the vector of independent variables) of being in a higher group is given by the formula

$$P(Y_i=j) = 1/(1 + \exp(-A_j - X_i B))$$

where  $A$  is the intercept parameter,  $j = 1, 2, \dots, k$  and the range of the dependent variable  $Y$  is  $0, 1, 2, \dots, k$ , and  $X_i B$  denotes the vector of regression parameters for the  $i$ th observation (i.e.  $X_i B = X_{i1}B + X_{i2}B + \dots + X_{in}B$ ).

As in ordinary least squares regression, variables with a negative Beta weight tend to reduce the chances of being in a higher group, while those with a positive sign tend to increase them. As the Beta weight approaches zero, the variable has less impact on the probability of being in a higher rather than lower group of the dependent variable.

While the relative effect of any one variable can be evaluated by considering the Beta weights, interpretation of the results can sometimes be difficult since the dependent variable in the regression equation is a logit of probabilities rather than a metric. It is useful to illustrate variable effects by considering the predicted probabilities derived from the logistic regression equation given above. This is simply done by inserting appropriate Beta weights, independent variable values and intercept parameters into the equation. Successive calculation of the probabilities for each intercept parameter yields cumulative probabilities from which probabilities for each category of the dependent variable can be obtained by subtraction; these can be expressed as percentages. Conventionally, these effects are evaluated at the mean for each of the dependent variables (Pedersen 1985), but it may be more useful to insert other values to illustrate particular effects.

The specific program in SAS used in this study was developed by Harrell (1980).

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